

50 CENTS

Construction Methods AND EQUIPMENT

A MCGRAW-HILL PUBLICATION

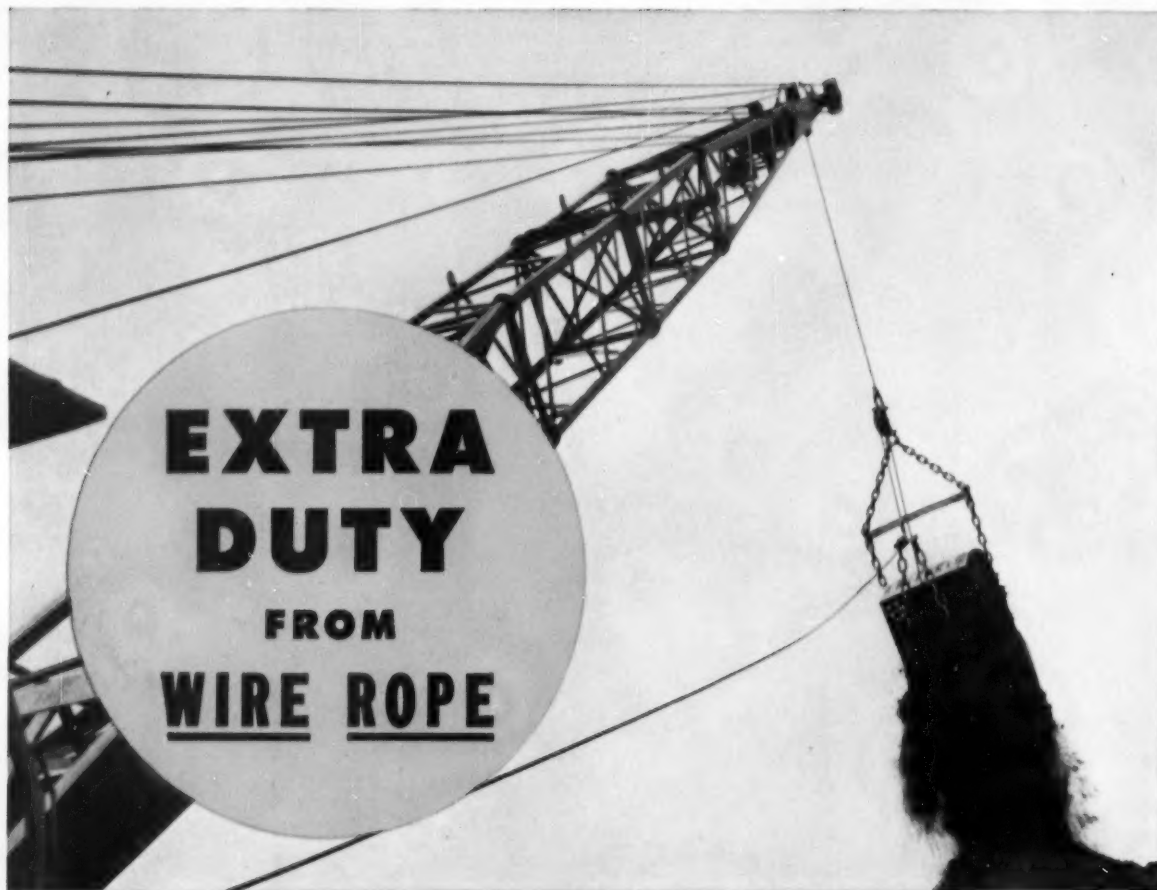
NOVEMBER, 1956



In California, powered trowel makes short work of finishing concrete slabs for aircraft company's atomic and rocket development facility.

More than 85,000 sq ft of floor space are included in job . . . p. 2

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EXTRA DUTY FROM WIRE ROPE

Extra duty — extra hours! That's what users report for Yellow Strand Flattened Strand on construction jobs.

Yellow Strand Flattened Strand has strands of triangular shape — distributing the wear over a greater number of wires. This means longer life and less wear on rope and grooves. In addition, it's manufactured to the highest standards of quality by Broderick & Bascom Rope Co.

Take the tip from many satisfied users of Yellow Strand Flattened Strand and specify it on your next

order. Take advantage, too, of the prompt service and "on hand stocks" of nearby Yellow Strand Distributors. They're ready to serve you with the right rope when you need it.

COMPARE

Yellow Strand Flattened Strand with Round Strand Wire Rope. In Flattened Strand you have twelve contact points, greater bearing area, smoother surface, less wear. Result: longer service, lower final cost!



Flattened
Strand
Wire Rope

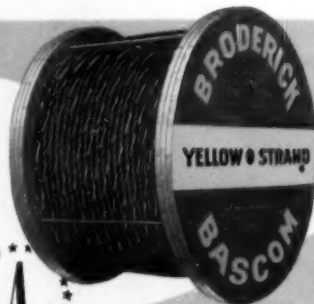


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American Logging Tool Corporation is a subsidiary of Broderick & Bascom Rope Co.

B.F. Goodrich



How all-nylon Super Traction tires pull contractor through the big, tough jobs

SUGDEN & SIVIER, INC., operate 150 vehicles, including dump and transit mix trucks, semi-trailers, scrapers and graders, out of Oak Park, Michigan. The unit above is at work on a slag grading job at the Detroit Sewage Treatment Plant where both traction and flotation are all-important.

That's why this contractor chooses

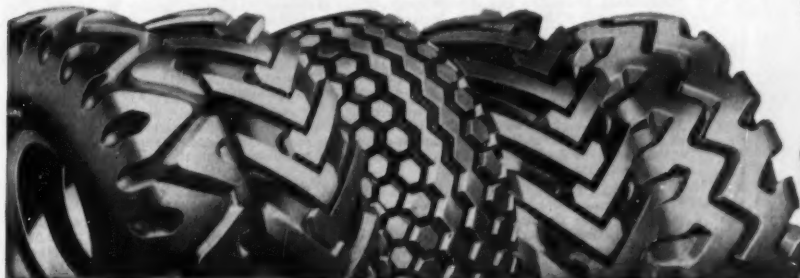
B. F. Goodrich *all-nylon* Super Traction tires. They pull through the big, tough assignments and do an "all-around job", the company reports. Thick Super Traction cleats take a deep bite, give positive traction. The wide tread makes a big footprint to give greater flotation in soft going. And under the tread is the B. F. Goodrich *all-nylon* cord body.

Nylon withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. That's why the B. F. Goodrich *all-nylon* cord body outwears even the extra-thick Super Traction tread, *can still be recapped over and over!*

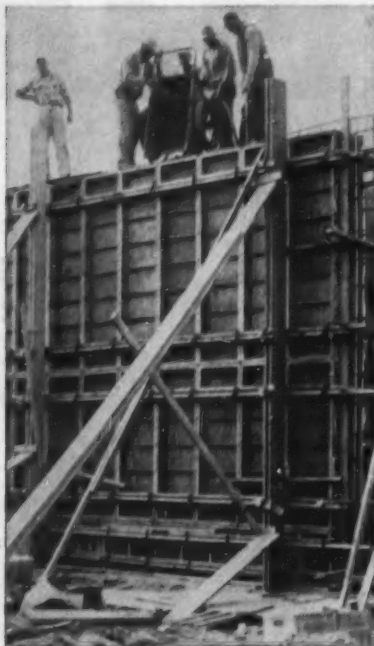
Your B. F. Goodrich retailer has the big, tough tires for your off-the-road work. Let him show you the ones that will save you money. Or write B. F. Goodrich Tire Co., A Division of The B. F. Goodrich Co., Akron 18, Ohio.

Specify B. F. Goodrich tires when ordering new equipment

There's a B. F. Goodrich tire for every construction job



Your B. F. Goodrich retailer is listed under Tires in the Yellow Pages of your phone book



Pouring Costs Cut 25% with Symons Forms...

Joseph R. Farrell, Inc., Philadelphia, general contractor, saved more than 25% in pouring costs on the new Cardinal Dougherty High School through the use of Symons Forms. 5,522 feet of Symons Forms were purchased for the job, and were used more than eight times. A total of 50,000 square feet of forming was erected for the 1600 yards of concrete.

Contributing to the speed and economy of the pouring was the use of 2" x 12" strong backs. The strong backs were held in place by 12" standwall ties used as strong back ties to make the horizontal joints stay plumb for the 18 and 20 foot walls. The strong backs permitted continuous pouring of the foundation walls.

With your plans, our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient and cost saving method of forming.

Symons Forms can be rented with purchase option. Symons Clamp & Mfg. Co., 4255 Diversey Avenue, Dept. L-6 Chicago 39, Illinois.

Workmen strip forms while a new pour is started.



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Construction Methods AND EQUIPMENT

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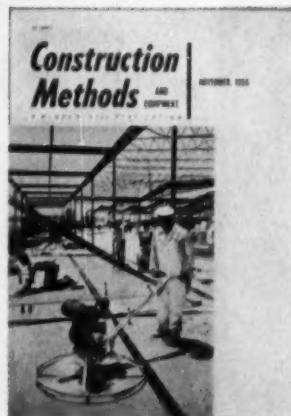
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On the Cover

A \$10,000,000 steel-frame structure now under construction at Canoga Park, Calif., will house facilities for rocket propulsion development and nuclear physics research for North American Aviation, Inc. George A. Fuller is general contractor, and Kaiser is the steel erector. Carson-Peters, subcontractor for concrete work, uses Superior Senior power trowels to finish slabs. The trowel, powered by an air-cooled Wisconsin engine, features a sealed and lifetime-lubricated gear box, a single-piece blade, and an easily reached crank that adjusts the blade when the machine is operating.



Member



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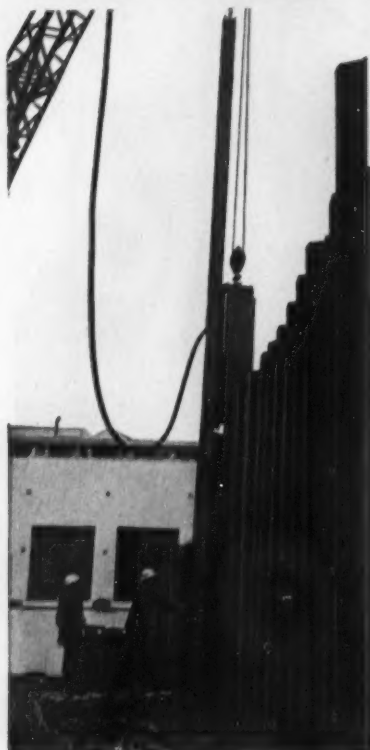
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At 3 P.M....

CAVE-IN!



Cave-ins will happen, through no fault of the contractor. On this excavation job, there was erratic soil behavior, shifting loads, saturating rain . . . everything unpredictable.

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November, 1956

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Next Month

Construction of retaining walls up to 35 ft high for the new Air Force Academy near Colorado Springs calls for 24,000 cu yd of concrete. Many time-saving construction kinks, plus excellent job planning, help job beat schedule.



Emergency conditions existed for a large Ohio manufacturer after a cloudburst hit this past summer. Finished stock in the plant basement was quickly submerged in 3 feet of muddy water. A Gorman-Rupp Model 3402 Pump was rushed to the scene and rapidly drained the area, halting the damage.

when the need is
URGENT
 ...make sure
 your pumps are
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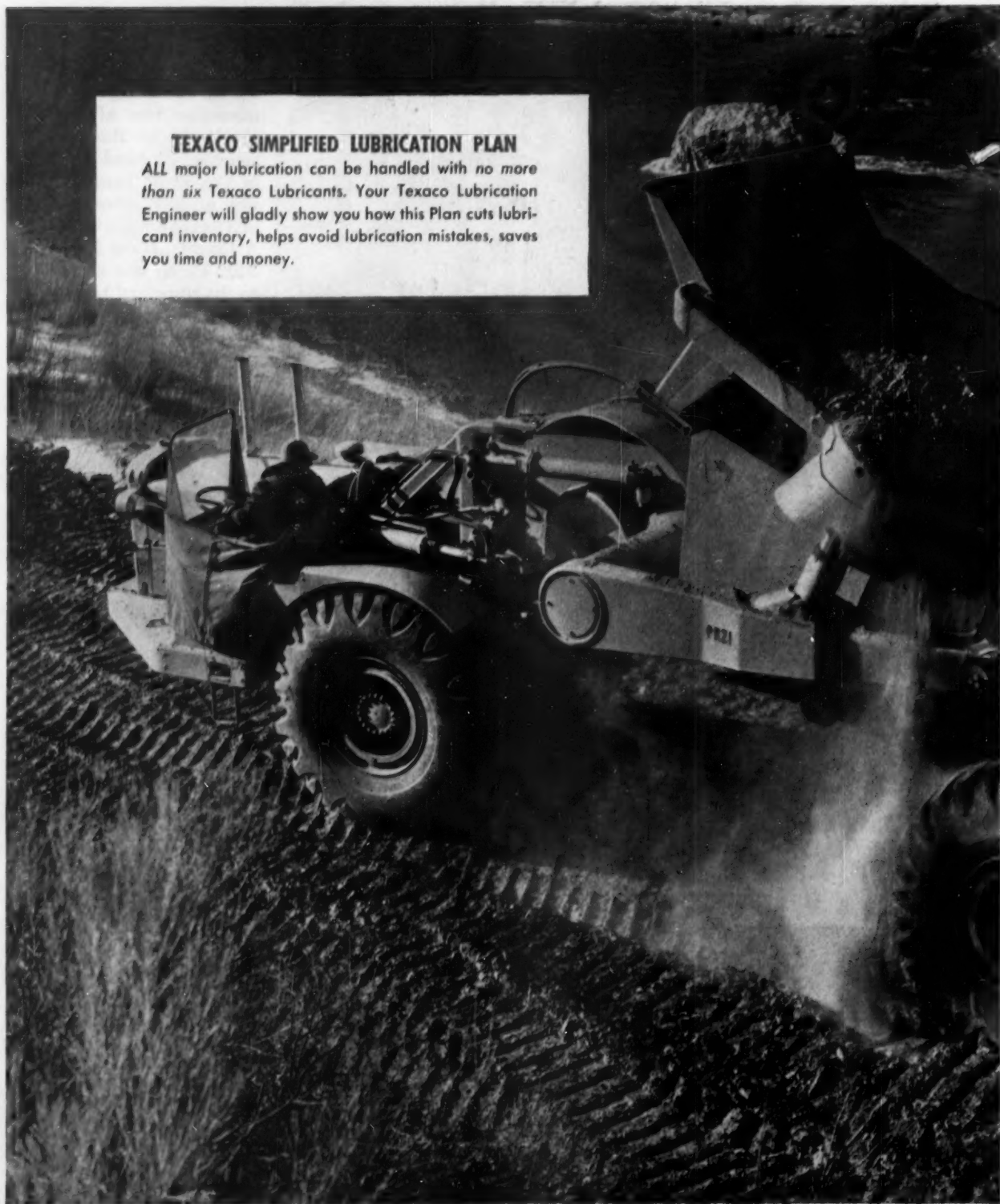
Emergency service under flood conditions brings calls for relief... with the need so pressing that a moment's delay is too costly. To use a pump that might break down or not even start would be ruinous. *Absolute dependability* then becomes the single most valuable feature of the pump you own. That's why Gorman-Rupp Pumps have so universally proved their worth. You can be confident of sure starting, quick priming, fast pumping and freedom from failures. Be sure at the time when you *must* be sure... standardize on Gorman-Rupp.

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Let a Texaco Lubrication Engineer help you simplify your lubrication and reduce your costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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← JAEGER "125" ROTARY (full load speed only 1700 rpm) has full size tool boxes, retractable pneumatic tired dolly, spring tow eye, many other attractive features.



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● Two Northwests on the Grass River Bridge, D.W. Winkelman contract.



● Northwest Pullshovel owned by Ingersoll Construction Co. on a lock job.

These contractors have a total of
58 Northwests on the St. Lawrence Seaway

58

NORTHWESTS

on the St. Lawrence Seaway

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DAM

ST. LAWRENCE
STATE PARK

ST. LAWRENCE
SEAWAY

BARNHART ISLAND
POWERHOUSE

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Beaver Construction Co., Ltd.
John Susin Construction Co.
Desourdy Construction Ltd.
D. Daniels Construction Co.
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J. J. Plott & McQuigge
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Northern Construction Co.
J. J. Stewart
Cormier Road & Gravel Ltd.
C. A. P.
Atlas, Winkelman
Walsh, Farrel Morrison-Knudsen,
Kiewit, Utah Construction Co.
B. Farrel & Sons, Walsh, Morrison-
Knudsen, Kiewit, Utah Construction Co.
Morrison-Knudsen, Kiewit, Utah Construction Co.
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Remember the Turnpikes—the New York Thruway (more Northwests than any other make)—the West Virginia Turnpike (over half the shovel and crane equipment Northwests)—the Ohio Turnpike, the Kansas Turnpike, the Maine Turnpike Extension, the Massachusetts Turnpike, the Connecticut Turnpike, all dominated by Northwest equipment.

Here is another world famous job—a job involving everything from rock to simple material handling—another job

predominantly Northwest equipped—over 58 Northwests handling all types of work from Shovel and Pullshovel excavation to Dragline and Crane jobs.

If you are planning on Shovel or Crane equipment, the outstanding leadership of Northwest on both big jobs and small is worth thinking about. There is a reason—Northwest Advantages make money. Plan now to have Northwest equipment. Let a Northwest Man give you complete details.

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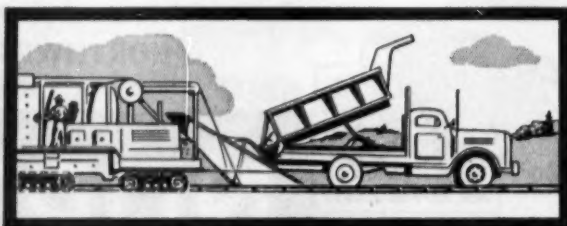
DYNA-COM

**... and here are 10 ways
it helps CONTRACTORS and
BUILDERS save money**

**Coordinates men and equipment ★ Speeds repairs
Expedites orders faster ★ Cuts no-load miles ★ Im-
proves operator's morale ★ Controls field operations
Cuts down-time ★ Enables equipment to be shifted
quickly from one site to another ★ Helps meet
emergencies in minimum time ★ Eliminates vehicle
messenger miles**

Good communication is vital in keeping projects running smoothly and in meeting construction deadlines. And that's just what Bendix® Dyna-Com Radio gives you. Good, clear, dependable communications. Radio contact frees superintendents and field foremen from extra miles of driving making routine checks. It allows them to spend more time at critical points where they are needed most. Bendix Dyna-Com Radio provides the instant voice contact between all key personnel that results in smoother, on-schedule operation. It prevents duplication of work effort, eliminates lost time for both men and equipment.

FROM SUPPLY BASE TO CONSTRUCTION SITE Bendix 2-Way Radio performs many time-saving functions from supply base to construction site. In addition to solving traffic control problems, it enables you to put equipment where it is needed most in minimum time. Loading tie-ups are avoided, material flow speeded. Complete coordination of men, supplies and equipment through use of Bendix 2-Way Radio boosts over-all efficiency.

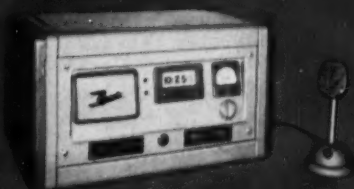


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Dyna-Com Mobiles Cover all frequency ranges: 25-54 mc; 144-174 mc; 450-470 mc. Available in power outputs from 15 to 60 watts. Interchangeable between 6 and 12 volt vehicles without modification.

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Construction News From Washington

Washington, D.C.
November, 1956

Billion Dollar Project Gets Underway

President Eisenhower pushed a telegraph key in the White House to break ground on a mammoth Reclamation Bureau project last month, dramatizing a start that will help make this fiscal year one of the biggest in the history of the Bureau.

The signals launched the \$1-billion Upper Colorado Project—starting construction at the Arizona site of Glen Canyon Dam and at Flaming Gorge Dam on the Green River near the Utah-Wyoming line.

Jobs at these two sites rank high on the list of construction contracts that Reclamation will put out for bids within the fiscal year that ends June 30. The Bureau plans bid calls for 86 major contracts with an estimated value of \$306 million during the remainder of this fiscal year. Far bigger, of course, is the estimated overall cost of completing the projects which these contracts will advance.

New Lease-Purchase Approvals

An additional \$200 million of lease-purchase buildings has been approved by the administration in one batch. This is the final step in the lease-purchase procedure, permitting awards for architect-engineer contracts for 28 new government buildings all around the country.

Largest single lease-purchase project in this group is the \$65-million federal office building to be built in New York City. To date a total of 98 building projects have been approved through the General Services Administration. Estimated completion costs are about \$700 million.

In this latest package there are buildings in 20 states ranging from Connecticut to Colorado, from Florida to Minnesota. Twenty of the projects will run over \$1 million each; ten of these will cost \$6 million or more.

Court Cases Hit Construction

Contractors should watch the Supreme Court for labor decisions it will be making during the term that has just opened.

A big case involves the San Diego Building Trades Council. The question is whether a state can enjoin picketing against an employer who is involved in interstate commerce but is so small that the National Labor Relations Board refused to consider the case.

NLRB's refusal to take cases like this has created a "no man's land." In this case, California moved in, and now the Supreme Court must decide whether the state can intrude on federal jurisdiction.

Continued on next page

Highway Spending Outlook

New federal funds for roadbuilding during fiscal 1958 have been allocated to the states since August 1 of this year, permitting the states to enter into contracts that will be paid for with the help of this federal money.

For fiscal 1958, the new money amounts to \$2.55 billion. Of this, \$1.7 billion will go to pay 90% of the cost of work on the 40,000-mile interstate system. The remaining \$850 million will pay 50% of the cost of construction on other federal-aid roads.

Actual federal expenditures, however, will be only 60% of the funds available to the states. The big speed-up construction program enacted late in June is too new to permit the states to get rolling in volume by next July 1, when fiscal year 1958 comes in.

On the basis of figures worked up by the Bureau of Public Roads, spending in fiscal 1958 should amount to about \$1.5 billion.

Highway Program to be Probed

Look for a complete investigation of the state of the new highway program early next year—regardless of which party wins control of the House and the Senate.

Reason: key Congressmen find there is no clear picture yet as to:

- 1) How the states are coming along with their highway plans.
- 2) Whether there will be steel, cement, equipment, and manpower to get the job going on schedule.

Already, Congressman Fallon, who is chairman of the roads subcommittee of the House Public Works Committee, has promised that the committee will begin to work on these questions as soon as Congress comes to town in January.

Need a Loan?

If the money squeeze is hurting you, check the Small Business Administration as a source of credit. The Eisenhower Administration has been making it easier for the agency to grant loans. Just last week SBA increased the maximum it will contribute to a loan shared with a bank and gave local officials authority to approve more loans on their own without Washington's okay. Last month SBA loaned \$7.6 million to 223 companies—double the rate of a year ago.

Corps of Engineers Construction Rising

Flood-control and rivers and harbors construction by the Corps of Engineers is expected to rise to \$1 billion a year by 1959, Washington authorities believe. Money available for spending in the current fiscal year on projects in these categories comes close to \$750 million. By 1958 or 1959, government experts expect Congress to be appropriating funds that will finance these projects of the Army Engineers to the tune of \$1 billion a year.



"Two Clark planetary axles make this truck an ideal drift-bucker"

..... Hydro-Quebec

For transporting equipment cross-country, through northern Quebec's heavy snows to a new power development, Hydro-Quebec converted trucks of conventional type to four-wheel drive by installing Clark Power Trains—torque converter, transmission and two Clark planetary axles, one steering and the other non-steering. "Excellent equipment—doing a great job," says Hydro-Quebec.

Clark's planetary axle has established an extraordinary performance record in extremes of punishing service—a record high-lighted by the virtual elimination of broken axle shafts.

In this revolutionary axle 70 percent of the driving torque is transferred to the planetary assembly in the drive-wheel—in contrast to conventional design, in which the full torque load is delivered directly to the axle shafts. Shaft wind-up and surge are practically eliminated, and broken shafts virtually unknown. Power flows smoothly—no chatter, no "digging" in soft ground. Also, by means of better torque-load distribution, this axle combines maximum rugged strength with minimum size and weight.

Are you looking for ways to improve your machines?—to get more work done? Get acquainted with this new axle that outlaws broken shafts. A helpful bulletin provides full information—use the coupon.

Primary Reduction in the center section, by helical bevel pinion and gear.



Second Reduction in the drive wheel—a sun gear splined to the axle shaft and three planet gears driving an internal gear in the inner periphery of the wheel, as close as possible to the point where tractive effort is applied.

Two types: steering and non-steering.

CLARK EQUIPMENT COMPANY • AXLE DIVISION, Buchanan 6, Michigan

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GREAT NEW IDEA in

52 hp

WORK BULL Model 404 with $\frac{3}{4}$ -yd. low-pivoted loader. Like all **WORK BULLS**, 404 has specially designed industrial front axle and heavy-duty clutch. (Diesel engine is optional.)



42 hp

WORK BULL Model 303 with angle dozer and backhoe. Gasoline engine, standard, offers high torque at low speed for better lugging. (Diesel optional.)



34 hp

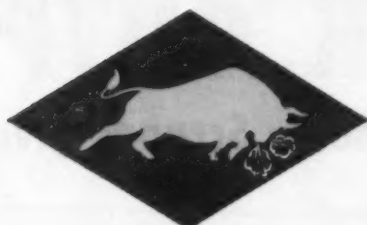
WORK BULL Model 202 with hydraulic-controlled hoe. Most of the **WORK BULL** attachments can be switched in 5 to 15 minutes in the field — without special gear.



42 hp

Davis PIT BULL with $\frac{3}{4}$ yd loader features torque converter, reversing clutches and 5 speeds forward, 5 reverse. In many cases it outworks high-priced, single-purpose rigs.

tractors and attachments —



M-H-F

WORK BULLS

NOW — from one source — a package of 5 versatile, low-cost tractors with 20 power-matched, easily-interchangeable attachments!

Contractors! Industries! Utilities! Profit from this new idea in greater machine utility and efficiency. Get the benefits of low cost attachment interchangeability . . . the high-profit performance of tools matched to power and speed . . . the adaptability of job-matched equipment to replace or supplement high-priced, single-purpose units.

What's more, you enjoy the advantages of a single sales and service source — a complete package — available only in the low-cost WORK BULL line.

New, and built to excel where other wheel tractors fail, WORK BULLS pay off in a wide variety of applications . . .

As primary equipment, WORK BULLS put former hand work on a power basis . . . efficiently handle scattered, work-and-run assignments.

As backup machines, WORK BULLS team with medium-priced, single-purpose equipment . . . give you the power equipment ratio that exactly fits the job.

As utility or cleanup tools, WORK BULLS are perfect for hustling around big layouts and relieving big equipment of unprofitable odd-job duties.

Get the complete WORK BULL story now. Write for 24-page illustrated catalog.

IMPORTANT NOTE TO RETAIL DISTRIBUTORS — WORK BULL franchises are still available in a few key areas. Write or wire for details.

Look at this wide choice of integrated WORK BULL attachments!

LOADERS—9 or 11 cu. ft.;
3/4-yd. or 1 1/4-yd.

BACKHOES—12, 16, 20,
24 or 36" buckets

MOWERS—Reel, rotary or
side-mounted

FORK LIFTS—2000 and
4000 lb. capacities

BLADES—Bull dozer, an-
gle dozer or grader

BROOM OR SWEEPERS

POST HOLE DIGGERS

ROTARY TRENCHERS
PIPE AND CABLE LAYERS

SNOW PLOWS

UTILITY BOOMS

SCARIFIERS

HAULING HITCHES



**FORK
LIFT**

Fork Lift Model 202 has lifting capacity of 1500 lbs at full height, 4000 lbs at half height. Optional mast gives lift heights to 21 ft. Works on or off hard surface.

M-H-F WORK BULLS

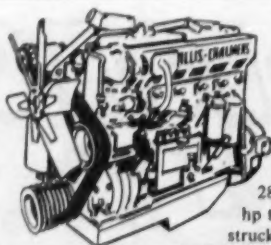
Division of Massey-Harris-Ferguson, Inc.

20-K Quality Avenue

Racine, Wisconsin

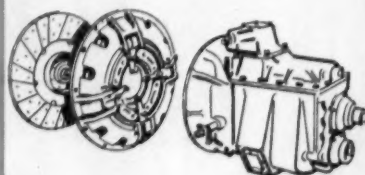
Look at the EXTRA WORK OUTPUT the Allis-Chalmers TS-360 Motor Scraper gives you

Here are some of the design features that put the TS-360 way out in front in steady performance, dependability and length of service life.

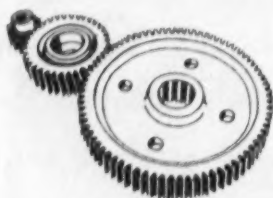


MORE USABLE HORSEPOWER.

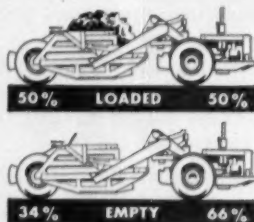
A heavy-duty Allis-Chalmers diesel engine delivers 280 hp to provide 18.66 hp to move each yard of struck dirt. This power gets the TS-360 away from the pusher fast... gives you speedier cycles, more trips per hour. In this engine, combustion timing and pressures are controlled for high efficiency. Air and fuel are mixed thoroughly for more complete burning. Follow-through combustion holds effective working pressures to take advantage of better crankshaft leverage.



BIG-CAPACITY CLUTCH AND TRANSMISSION give fast, smooth operation under all job conditions. Clutch has air-actuated booster to reduce clutching effort and increase shifting efficiency. The heavy-duty transmission gives unmatched torque output in each gear range.



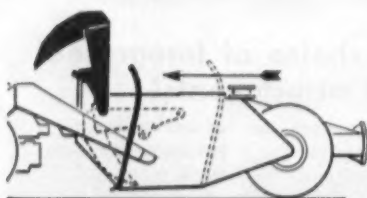
EXTRA-HEAVY FINAL DRIVES feature rugged differential assembly, carrier-housed drive shafts, final drive gears supported by large roller bearings and heat-treated drive axles. This long-life power train transmits maximum engine output for extra work volume, extra profit.



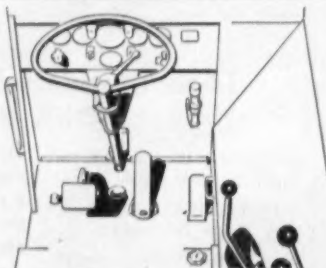
EXTRA TRACTION. The TS-360 motor scraper provides greater tractive effort, loading or traveling. Two-thirds of the empty weight is carried on drive wheels. Loaded weight is distributed equally between tractor and scraper wheels for better balance, increased flotation, safer hauling.



EASY-LOADING BOWL. Wide, low bowl design with curved bottom and offset cutting edge assures full capacity loads in less time. Curved bowl bottom "boils" dirt in, filling corners, heaping load with less spillage.



CONTROLLED DUMPING ACTION. Forward movement of ejector forces out load. High apron lift prevents material from jamming. This combination provides a continuous flow of material for a smooth, even spread.



POSITIVE STEERING. Two-stage selective power steering makes the operator's job easy... provides safe, feather-touch response and full maneuverability whether traveling at high speeds or in cut or fill.



OPERATOR CONVENIENCES add to production, too. Easy-to-reach controls, full visibility, four-wheel air brakes, roomy platform, comfortable air-foam seat are some of the features that help operator get maximum output from the TS-360.



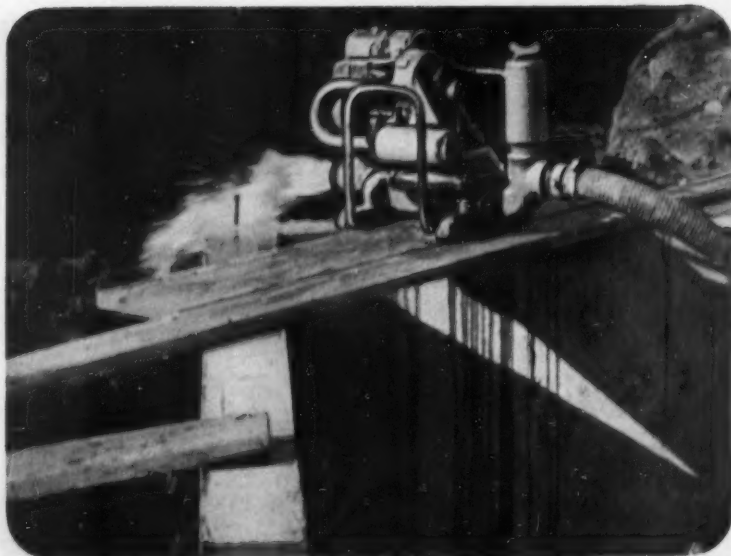
More and more TS-360's are coming into your area every day. Ask your Allis-Chalmers construction machinery dealer where you can see them in action. Remember, too — your Allis-Chalmers dealer stocks True Original Parts and offers factory-approved service methods and factory-trained servicemen for your convenience.

Get all the facts
from your Allis-Chalmers
dealer—now!

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

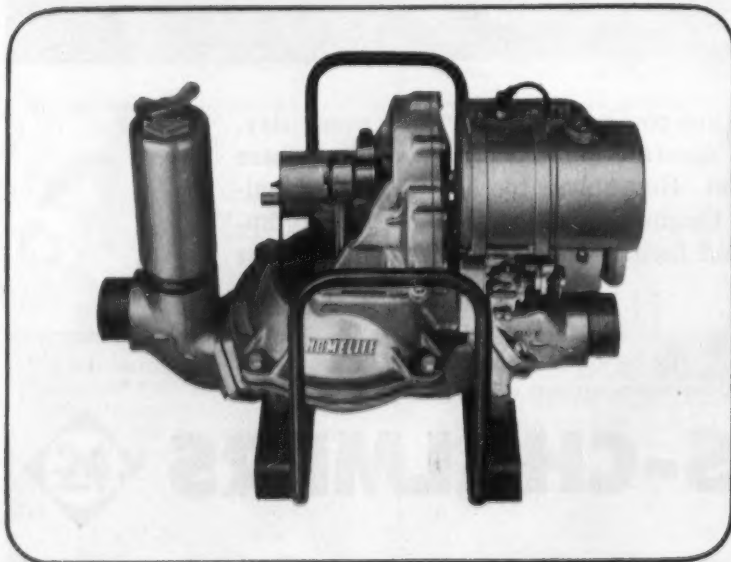
ALLIS-CHALMERS





It's here!

**The new heavy-duty
diaphragm pump
that's light enough
to carry**



Here's the diaphragm pump that goes most easily to the job and does more when it gets there. Specifically designed for continuous, heavy-duty work, this Homelite pump will dewater an area at a 5000 g.p.h. clip, then keep right on going to handle seepage in the thickest mud, muck and sand. Yet, because it weighs only 120 pounds, it gets to the job fast . . . even over the roughest terrain.

The entire unit is built for long, trouble-free operation. Manual throttle control adjusts engine speed for full-capacity pumping or handling small seepage flow . . . gives greater fuel economy and prolongs engine life. Ball and roller bearings protect engine and pump from excessive wear. Totally enclosed reduction gears run in oil. Tough, oil-resistant diaphragm can be easily replaced in ten minutes right on the job.

For more information or a demonstration on your job, write or call your nearest Homelite representative.

NEW HOMELITE
Carryable
DIAPHRAGM PUMP

Model 20DP3-1 has guaranteed total lift up to 28' and total head up to 50', including friction.

HOMELITE

A DIVISION OF TEXTRON, INC.
1011 RIVERDALE AVENUE
PORT CHESTER, NEW YORK

Job Talk...



Scrapers Move Rock on Oklahoma Turnpike

S. E. Evans, Inc., saved time and money on his Oklahoma Turnpike job by excavating a cut of limestone and flint with scrapers. About half the rock first was drilled and blasted. The other half, which was somewhat softer, first was ripped.

Ingersoll-Rand units mounted on Cat D8's did the drilling, and a Cat No. 28 and a LeTourneau-Westinghouse K30 did the ripping. Rock was push-loaded into four Cat DW21 scrapers by Cat D9 tractors.



Scaffolds Support Tricky Formwork

Forms for unique cast-in-place concrete bents at Fort Lauderdale, Fla., are supported on Beaver scaffolds. Crane places concrete in top of A-shaped form to create rigid frame skeleton structure for new MAI-KAI Polynesian Restaurant. Because of difficulties of making the rigid connection at the crown of the bent, cast-in-place methods were adopted instead of precast. Milbrand Construction Co. is the contractor.

Masking Tape Seals Hung Ceilings

Plasterboard joints on hung ceilings can be sealed quickly and economically with pressure-sensitive masking tape. On the new Travelers Insurance Company Building in Hartford, Conn., Plasterboards are nailed into special

channels overhead and their joints taped with Behr-cat strips 1½ in. wide. This prevents seepage of air and dust from the chamber, and also eliminates discoloration at the edges of acoustical tile.

Continued on next page

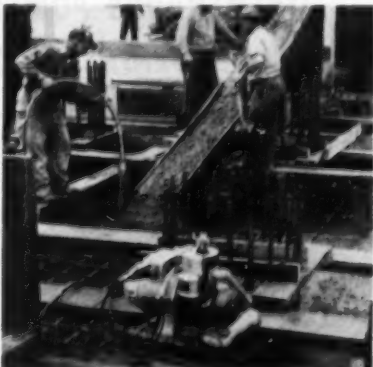
Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".



Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.

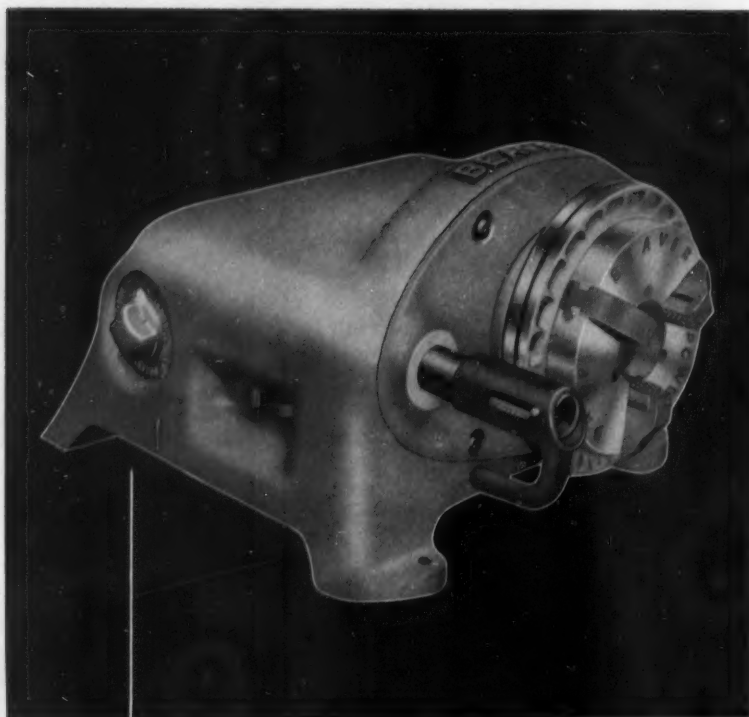


One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators and 110 volt DC for all universal vibrators, tools and floodlights.

HOMELITE

a division of Tectron Inc.

PORT CHESTER, NEW YORK



THE NEW
BEAVER
Porto-Mite
 Super Drive

**THE WORLD'S LIGHTEST 4-LEGGED POWER DRIVE!
 TREMENDOUS POWER AND RUGGEDNESS!
 WEIGHS ONLY 84 POUNDS!**

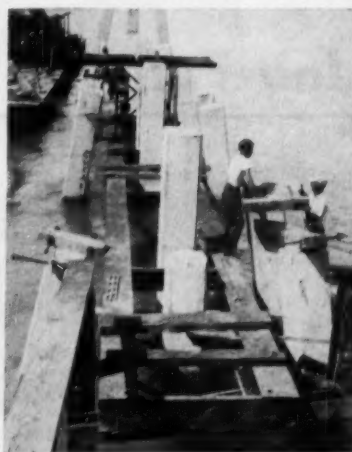
● A one-man unit with four-legged stability . . . gears lubricated for life . . . lighter but more rugged . . . entirely new throughout . . . faster, more powerful, completely new greatly improved motor . . . quick-acting Power Grip Wrenchless Chuck . . . positive grip forward and reverse . . . instant and accurate, easy setting rear guide eliminates double chucking . . . motor and switch fully protected . . . all parts accessible for minimizing upkeep and maintenance . . . power to spare to drive geared tools up to 12" . . . smooth, streamlined, polished aluminum housing.



Get all the facts about
 the New Beaver Porto-Mite
 Super Drive. Write for
 Bulletin No. PM 56 Now!

THREADED PIPE: It's Tight—It's Best—Costs Less
BEAVER
PIPE TOOLS
 228-400 DANA AVE. • WARREN, O., U. S. A.
 "55 Years of Highest Quality"

JOB TALK . . .
 Continued



**Templet Guides
 Concrete Piles**

A steel templet supported on temporary H-piles is doing a good job of positioning concrete piles on the new MacArthur Causeway in Miami, Fla. Powell Bros., Inc., of Fort Lauderdale, built the templet with enough flexibility to handle not only plumb piles, but also those battered in one and two directions. A positioning frame on top can be moved and bolted to any part of the templet to handle each driving condition. Bolt holes are provided the full length to permit maximum flexibility.



**Narrow Tamper Ideal
 For Conduit Trenches**

Slit-type trenches for conduits at New York's Idlewild Airport are getting fast, vigorous compaction from a small Jay 12-in. tamper. Powered by a gasoline engine, the unit rides on two rear wheels as a plate tamps in front. The operator can adjust the intensity of the blows by moving the handle forward and backward.

Raves for no ravin' beauty...



"What a beating! But in 12 years, trucks have never had a lubrication failure!"



FOX RIVER'S MIGHTY MACHINES all provide trouble-free performance using Cities Service Gasolene, Diesel Fuel, and Lubricants. These outstanding products help the company operate at 150 tons per hour.



THAT'S DUST, BROTHER! This motor, buried in dust, is typical of operating conditions at Fox River Stone Company. Yet, using Cities Service Pacemaker Oil, there's never been a bearing failure. Never any lubrication problems.

Fox River Stone Company, Elgin, Illinois, reports trucks wear out externally, are still good internally using Cities Service Lubricants.

Operating at the rate of 150 tons per hour under the toughest conceivable quarry conditions, Fox River Stone Company produces barn and agricultural lime, 2" and 3" stone for road construction, "A" and "B" binder for asphalt road construction, flagstones, and a host of other crushed stone products.

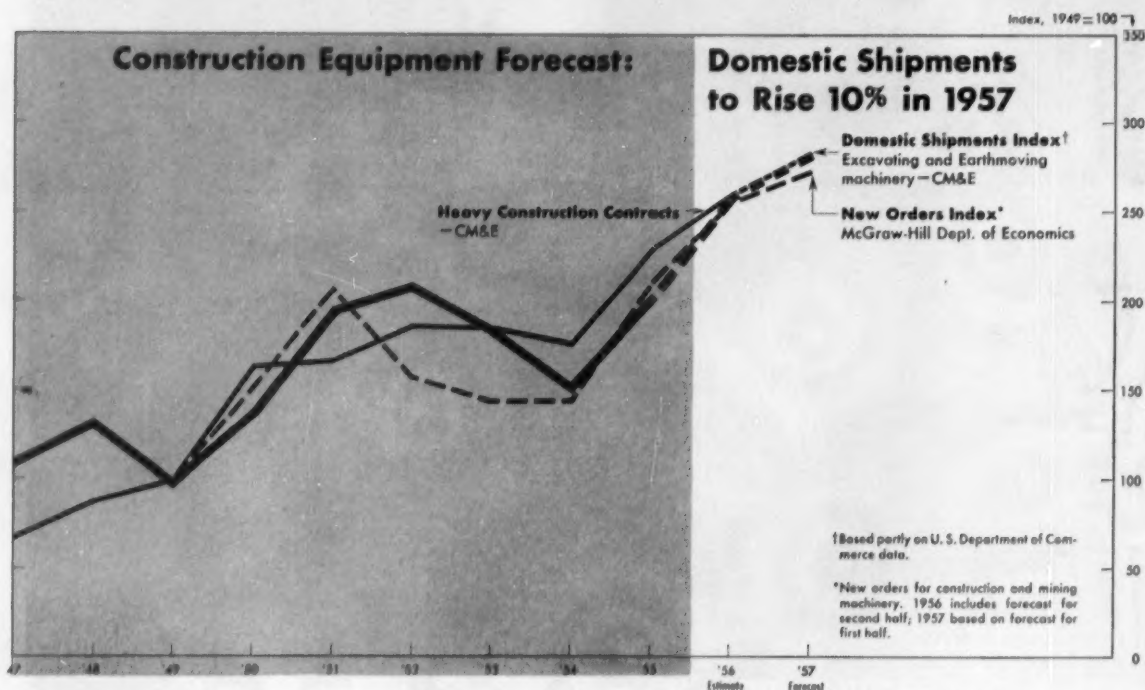
Yet, during the last 12 years, there's never been a lubrication failure of any kind in any piece of machinery using Cities Service Lubricants.

With the aid of Cities Service Gasolene, Diesel Fuel, and Trojan H-2 Multi-Purpose Grease, Fox River's many shovels, pay loaders, and trucks have given constantly flawless performance. And despite the extremely dusty quarry conditions, exposed electric motors have never lost a bearing using Pacemaker 150 T Lubricating Oil.

Not one lubrication failure in any of this equipment during 12 years of rugged operation! That's Fox River's record with Cities Service and it can be your record when you start using Cities Service Products. For information, talk with your nearest Cities Service representative or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES  SERVICE
QUALITY PETROLEUM PRODUCTS

It's Your Business . . .



Construction Equipment Shipments Will Rise 10% Next Year

EQUIPMENT MAKERS and distributors are racking up their biggest sales volume in history this year. CM&E's Domestic Shipments Index will hit a new all-time high of 260 for the year. This is a 27% increase over the previous record dollar volume of shipments set in 1955. It means that this year's shipments will be more than two and one-half times the dollar value of 1949 shipments, when the CM&E Index was 100.

The outlook for next year is for a further rise in the value of shipments. CM&E forecasts that its Index will hit 285 in 1957, 10% more than this year's record. The prediction is based on these three indicators:

- New orders for the first half of 1957 will be 6% higher than the 1956 average, according to the new Index of Orders for Construction and Mining Machinery compiled by the McGraw-Hill Department of Economics.
- Heavy construction contract awards will rise 10% next year (including a 22% increase in heavy construction other than building) according to CM&E's preliminary estimates.

- Further increases in equipment prices next year will push average prices for the year to 4% above the 1956 average.

The total dollar value of construction equipment shipments this year, based on the CM&E Index, will be \$1.8 billion. Next year's total should rise to about \$2 billion. Both totals include export shipments.

New Orders Will Go Up, Too

New orders for construction and mining machinery are likely to set a new record for any quarter during the last three months of this year. A further modest increase in the first quarter of 1957 also is probable, and a leveling off is expected in the second quarter.

This trend in orders is indicated by the McGraw-Hill Department of Economics' New Orders Index which is based on a sample of equipment manufacturers who have forecast their orders as far ahead as the second quarter of next year. (Next month CM&E will report returns from these equipment makers showing their estimates of what they ex-

Continued on page 27



You can't tell the difference?

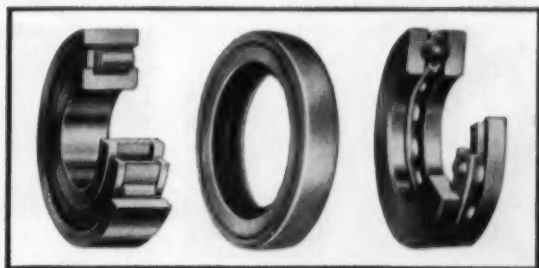
Take a substitute anti-friction bearing. Probably looks exactly like a Caterpillar part. But remember, there are many different bearings that fit a shaft and bore, yet only *one* may be right for maximum performance—the one designed especially for the machine—the one tested, specified and supplied by Caterpillar.

The same with seals. While seals may look alike, the material can vary in tensile strength, resiliency and hardness. CAT* lip-type seals meet *special* standards that assure the long-life reputation of Caterpillar machines. They are *matched* to the parts they protect. They're *right* for their particular job.

Why take chances with substitute parts? You're sure of finest quality and *maximum life* with Caterpillar parts!

Better see your Caterpillar Dealer's Salesman—and get Cat original parts every time.

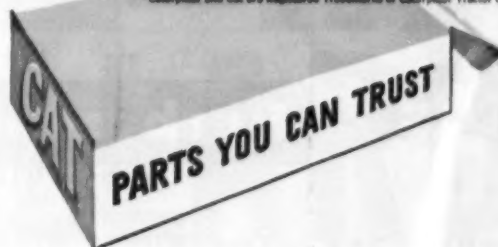
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



Each Cat anti-friction bearing and lip-type seal has been proved best for its particular application. Each one is assigned a Caterpillar part number — used only for that part in that application. Can you be sure with so-called "will-fits" and "look-alikes"?

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.





Cutting costs is the primary function of portable conveyors

To make the greatest cost savings, portable conveyors must:

... have quality construction for long life and trouble-free operation. They must be available in the length and capacity range to suit your needs. They must be available with the features and accessories you want—screens, power hoists, pneumatic or steel wheels, gas or electric drives, etc.

They must be easy to move around the yard ...

easily towed from job to job. They must withstand constant use and frequent movement.

Shown above is the portable conveyor of advanced design, the Barber-Greene 363. Shaft and gear reducer drive—no chains—no sprockets, full swiveling wheels, Acme take-ups and many other exclusive features.

Shown below are other models in Barber-Greene's complete line of cost-cutting conveyors.



Model 374 cuts cost at high capacity. With capacities up to 425 t.p.h., this heavy-duty machine has antifriction bearings, shaft and gearbox drive, hydraulic boom hoist and other features.



Model 358 cuts cost of car unloading. Feeding a conveyor, this car unloader releases cranes and other expensive equipment for other work. Handles gravel, sand, stone, cinders, etc.



Model 362—low-cost, high-quality portable. Three-roll carriers, swivel wheel truck, and many other features not available on conveyors of this low-price range, are standard on the 362.

Write for literature on any portable in the Barber-Greene line.

56-B-PO



Barber-Greene

AURORA, ILLINOIS, U.S.A.



CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

IT'S YOUR BUSINESS...
continued from page 26

pect in new orders for the third quarter of next year.)

Forecasts for the first half of 1957 put the Orders Index at 274 for the first quarter and 273 for the second quarter. This level of new orders has been exceeded only once since the index was started in 1949. That was in the first quarter of 1951 when the index shot up to 293. At that time, contracts for industrial construction skyrocketed due to the forced draft expansion of defense industries to meet Korean war needs.

Rental Rates Keep Rising

Contractors who are renting construction excavating and earth-moving equipment find they're paying substantially higher rental rates this year than last. A compilation by the Associated Equipment Distributors of rental rates in effect this summer shows that the 1953-55 uptrend in rental rates is continuing this year.

Here are some examples of how rental rates this summer compare with a year ago. They are based on the compilation of rates in AED's 1956 "Green Book" and were reported in AED's Construction Equipment News.

- Graders, diesel powered, rentals are up 4% to 19%, with an average rise about 11%.
- Tractors, diesel crawler with torque drive, are renting at rates which range from 8% higher (250-300 drawbar hp) to 24% higher (119-144 drawbar hp). Rates average 11% higher than in 1955. Rentals for diesel crawlers with gear drive have increased about 7% on the average, but 115-131 drawbar hp models are renting at rates averaging 4% below a year ago. For wheel tractors with two-wheel scrapers, rates average nearly 3% higher. Some are down 2%, others are up 8%.
- Power shovel rentals are 4 to 21% higher for diesel crawler types; the average rise is 12.5%.
- Cranes, diesel crawler, are renting at rates which are up 2% on the average for large capacity rigs; smaller capacity machines are up 15%.

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BRAND A

BRAND B

BRAND C

MARKS OF A KILLER!

BULLARD

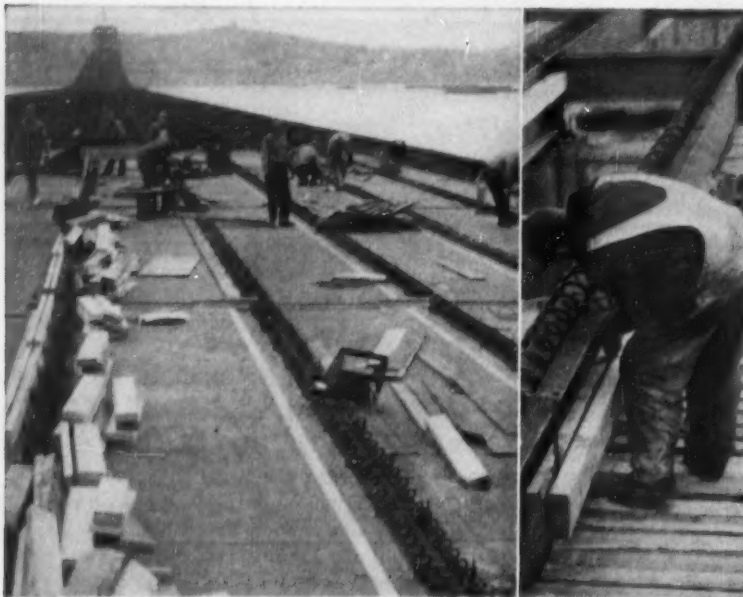


Can you read the marks of potentially killing blows from a five pound ball dropped 8 feet on the crowns of aluminum safety hats? The depth of the dents on this aluminum bar indicates how much actual impact the wearer would feel on his head. See how deeply blows on competitive hats A, B and C mark the metal. Yet, the BULLARD aluminum hat hardly shows a mark. This is because BULLARD'S exclusive full floating headband distributes and absorbs the blow, taking the danger out of the impact. This, coupled with the girder-like strength of the BULLARD three-ribbed crown provides the greatest protection possible in aluminum hats and caps. **COMFORT**—They are just as light as your old felt hat. The cap weighs only 10 ounces. And with BULLARD'S exclusive universal headband you're always assured of a perfect fit. **COLOR**—Now you can have a choice of permanent non-fading colors in aluminum hats—yellow-gold, blue, grey, green, bronze and silver. Colors to identify trade or company.



BULLARD

E. D. BULLARD COMPANY, 275 Eighth Street, San Francisco, California



Left: Erecting bridge deck forms. Right: Using Richmond Free-Fit Hanger Frame-Tys, workmen fasten walers from above. Contractors: Garofano - West-Shore - Euclid. Engineers: Madigan-Hyland.

"Fast forming method & Richmond Hanger Frame-Tys speeded up Tappan Zee deck paving"



Charles Spero

The 6-lane deck of the New York State Thruway Authority's 3-mile long Tappan Zee Bridge took 33,000 yards of concrete and considerable ingenuity. A combination of stock-size plywood sheets, filler strips of wood and metal, and Richmond Free-Fit Hanger Frame-Tys helped get the bridge open early.

Euclid's construction boss, Charles Spero, says they saved lots of time and money by hanging the forms with Richmond Free-Fit Hanger Frame-Tys—45,430 of them. Since the Richmond Tylag passes through an over-size coil and is adjusted by a nut on the upper end, the forms can be handled from above. "These Richmond Hangers speed up the whole operation," Mr. Spero points out. "You don't have to build a lot of scaffolding, work under the deck and risk accidents. The forms are quickly assembled, and easy to take out, too. And there's hardly any repair work to be done."

"What's more, they're more economical when you figure the cost per

foot," says this veteran Euclid superintendent. "A lot of fellows who use wires forget to figure the hidden costs—they don't stop to think about the labor putting in the wires and, later, the patching. With wages going up all the time, those savings keep getting bigger."



Richmond Free-Fit
Hanger Frame-Ty

Richmond also makes a standard type Hanger Frame-Ty with two helix coils. For use where a slab is haunched to meet the top flange of the steel beam, Richmond makes Offset Hanger Frame-Tys with coils high enough above the top of the beam to permit the metal to be properly set back from the concrete. Richmond Fascia Hanger Frame-Tys combine hanger and fascia-tys for use on outside girders of bridge decks.

All these—along with the complete line of Richmond engineered tying devices, anchorages and accessories—are described in the new Richmond Handbook. To get your copy—or help on a specific concreting problem—write to RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 So. Fourth Street, St. Joseph, Mo.



IT'S YOUR BUSINESS . . .

continued

Seven States Lead In Equipment Sales

Construction equipment dealers in seven states had more than one-third of total U.S. sales during 1954. They are: New York, Pennsylvania, Texas, California, Ohio, Illinois, and Missouri. These same states accounted for 50% of total heavy construction contracts in 1954, as reported by CM&E.

The table below shows the number, sales, and operating expenses by states of the 1,640 firms in this 1954 census by the U.S. Department of Commerce. Included are firms with one or more employees, primarily engaged in selling construction machinery. Manufacturers' sales branches and sales offices aren't included.

Construction Equipment Dealers

(Bureau of the Census, U.S. Department of Commerce)

Region and State	No. of Establishments	Total Sales (Thous.)	Operating Expenses (Thous.)
U.S., total 1954*	1,640	\$1,401,350	\$268,544
1948*	906	779,882	128,413
1939	494	95,556	19,429
1929	252	56,171	10,915
New England	116	67,187	11,863
Maine	14	10,328	1,984
New Hampshire	10	4,351	673
Vermont	12	6,067	1,070
Massachusetts	44	35,626	4,813
Rhode Island	6	1,716	272
Connecticut	28	19,110	3,660
Middle Atlantic	287	234,172	47,463
New York	149	111,719	20,407
New Jersey	81	28,853	6,603
Pennsylvania	114	93,606	20,457
East No. Central	264	226,292	48,972
Ohio	83	64,077	13,906
Indiana	23	28,741	5,468
Illinois	49	54,089	11,742
Michigan	47	48,783	9,303
Wisconsin	32	30,693	8,753
West No. Central	181	179,876	32,928
Minnesota	45	42,323	7,143
Iowa	25	22,657	3,669
Missouri	50	54,074	10,465
North Dakota	10	7,824	1,740
South Dakota	19	7,873	1,602
Nebraska	19	27,641	4,878
Kansas	24	17,485	3,491
South Atlantic	199	101,082	21,192
Delaware	1	(D)	(D)
Maryland	21	23,526	3,813
D.C.	3	(D)	(D)
Virginia	35	29,837	5,334
West Virginia	99	24,262	4,521
North Carolina	28	36,783	5,063
South Carolina	19	11,854	2,124
Georgia	99	32,971	4,680
Florida	39	36,298	5,281
East So. Central	185	117,181	24,225
Kentucky	23	30,743	6,577
Tennessee	35	42,585	8,534
Alabama	23	22,711	5,098
Mississippi	16	29,149	4,616
West So. Central	163	141,321	25,472
Arkansas	18	11,346	2,082
Louisiana	29	26,619	4,911
Oklahoma	30	15,883	3,361
Texas	101	86,474	15,118
Mountain	123	100,594	18,806
Montana	27	22,708	3,920
Idaho	11	11,485	1,786
Wyoming	10	6,827	1,181
Colorado	26	18,554	3,554
New Mexico	9	12,676	2,137
Arizona	15	11,036	2,436
Utah	18	13,717	2,699
Nevada	7	4,601	893
Pacific	193	143,744	27,624
Washington	34	24,519	4,807
Oregon	42	38,180	7,056
California	123	81,045	15,760

(D) Withheld to avoid disclosure.
*Data for the years 1954 and 1948 exclude places of business without paid employees. In 1948 there were 25 establishments of this type with sales totaling \$1,485,000.



LOOK AT THE BOULDERS THIS D9 IS 'DOZING!

When there's a tough job to do, Schmidt Construction Co.,
Grand Junction, Colorado, hands it to this power-packed giant

Power is what the Schmidt Construction Co. wanted when it purchased this CAT* D9 Tractor with No. 9S Load-Shape Bulldozer. And *power* is what the company is getting. Here, on a construction job involving about 75,000 cu. yd. of rock work on Bear Creek Canyon Road near Denver, the D9's punch really paid off. Granite boulders, shot from the mountainside, proved too big for a shovel or other machines to tackle. Working 8 hours a day, 6 days a week, the D9 handled them with on-schedule performance.

Built for big production in tough going, the Turbo-charged D9 delivers 320 HP at the flywheel. To meet your needs, it is available with torque converter or direct drive. In spite of its weight—more than 29 tons—it works with the agility of smaller tractors. Hydraulic boosters provide power for steering, braking and master clutch use. Many other features also contribute to the D9's efficient, economical performance, among them:

- For more working power, its Turbocharger, driven by engine exhaust, packs air into the engine according to engine load, not engine speed.
- Its constant power drive for rear-mounted cable control makes the operation completely independent of flywheel clutch or torque converter, boosting efficiency.
- Its in-seat gasoline starting system with single-lever control provides quick, sure starts.
- It's easy to service major drive components—oil clutch, torque converter, transmission and steering clutches each can be removed individually.

Your Caterpillar Dealer, who backs all Caterpillar equipment with prompt service, will be glad to show you how the D9 can step up production and profits for you. Ask for a demonstration!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**STEP UP
PRODUCTION AND
PROFITS WITH THE D9**

without question, and with loads of proof *

the **P&H** Miti-Mite is production and earning

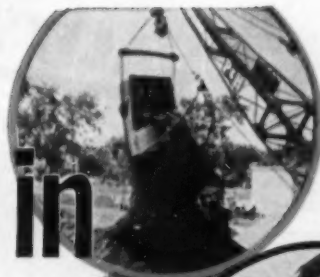


WHEN YOU BUY a truck crane it will pay you to compare any make with the P&H Miti-Mite. This comparison will prove to you what thousands of contractors experience every day—the Miti-Mite outperforms any other small truck crane no matter what the attachment.

Compare these facts and figures: the Miti-Mite delivers its full rated capacity *around the*

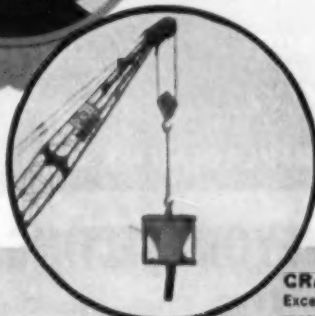
full 360° for complete flexibility... the Miti-Mite is rated at 8-ton crane capacity at 12' radius... has an 11 cubic foot shovel capacity and a maximum trench hoe width. And for crane use the Miti-Mite can handle a 50 foot boom with a 15 foot jib. These are the features you want in a truck crane for real capacity and high earning power—you'll find them only in the P&H Miti-Mite.

unbeatable in power



DRAGLINE

Full-size heavy-duty bucket is used by the Miti-Mite dragline attachment. For longer reaches, inserts in 5 and 10 foot lengths are available. Lattice-type boom provides strength without excess weight for faster cycles and greater payloads.



CRANE

Exceptional stability means faster operation with greater safety. Planetary boom hoist is standard. Boom point of the gooseneck is open-throated for maximum boom load clearance. 8-ton capacity at 12' radius.



MAGNET

Handles 39-inch magnet with 5 kw. generator. Planetary boom hoist provides quick adjustment to any working angle.



CLAMSHELL

No need for lightweight buckets with a Miti-Mite—this versatile machine swings a standard construction bucket.

SHOVEL

16½-foot shovel boom is all-welded with box section design for maximum strength without weight. Electrically tripped dipper has 11 cu. ft. capacity. Positive chain crowd and retract mechanism.



TRENCH HOE

Gooseneck boom permits greater digging depths and dumping heights. Performs in rock, hard pan, heavy shales, works in laterals, septic tank areas.



HARNISCHFEGER

P&H Power Crane & Shovel Division

HERE'S PROOF OF MITI-MITE'S EARNING POWER!

Harnischfeger Corporation, Dept. 1-F
P&H Power Crane & Shovel Division
Milwaukee 46, Wisconsin

Gentlemen:

Please send illustrated, certified, on-the-job performance reports proving Miti-Mite's extra capacity and earning power.

Name

Firm

Address

City Zone State

GOODALL QUALITY MEANS *Belting at its Best!*

TO ASSURE *Important Savings* IN OPERATING
AND REPLACEMENT COSTS



CONVEYOR BELTING

"SUPER TRIPLE-S"—Goodall's finest Conveyor Belting . . . for super-severe service. Built to handle crushed stone up to 10" and other highly abrasive bulk materials, wet or dry, particularly on long center hauls where tension is high and extreme flexibility is required. Weather-resistant cover. Tensile strength, friction and other details determined by specific requirements.

"TRIPLE-S"—Designed for severe service but where weight of bulk material and length of carry do not demand "Super-S" quality. Recommended for crushed stone up to 6" or 8", abrasive ores, etc.

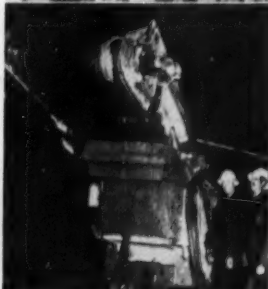
"LACROSSE"—A perfectly balanced, quality belt for all but the most severe conditions. Used for handling sand, gravel, shells, ashes, etc.

MUCKER BELTS

"Wear King" Brand. Developed especially for use on Conway Mucking Shovels in tunnel excavating, and employed on most of the largest modern tunnel jobs.

GRADER BELTS

"76" Brand. For many years, the Contractor's best assurance of long, trouble-free service on heavy-duty Elevator Road Graders.



"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870



HOSE • BELTING • FOOTWEAR • CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL Rubber Company

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches and Distributors Throughout the United States and in Canada

SOME BIG CONTRACT AWARDS OF THE MONTH

George A. Fuller Co., 597 Madison Ave., New York, N.Y. A 46-story glass, metal office with sub-basement garage and helicopter landing at Park and Lexington Aves., 53 and 54 Sts., New York, N.Y. for Vincent Astor, 152 W. 42 St., New York, N.Y. \$75,000,000.

F. H. McGraw Co., 51 E. 42 St., New York. Alumina plant at Burnside, La. for Olin Revere Metals Co. (Olin Mathieson Chemical Co.) Mathieson Bldg., Baltimore 3, Md. and Revere Copper & Brass Co., P.O. Box 111, Rome, N.Y. \$50,000,000.

Peter Kiewit Sons Co., 1024 Omaha Natl. Bank Bldg., Omaha, Neb. Plant near Omaha, Neb. for Western Electric Co., 195 Broadway, New York, N.Y. \$30,000,000.

Diesel Constr. Co., Inc., 24 W. 58 St., New York 19, N. Y. A 25-story office at 60 Broad St., New York, N. Y. Moses Ginsberg, 24 Sickles St., New York 34, N. Y. \$30,000,000.

McNeil Construction Co., 5858 Wilshire Blvd., Los Angeles. Research plant for Convair-Astronautics intercontinental ballistic missile, San Diego, Calif. Convair Div., General Dynamics Corp., 3165 Pacific Hy., San Diego, Calif. \$20,000,000.

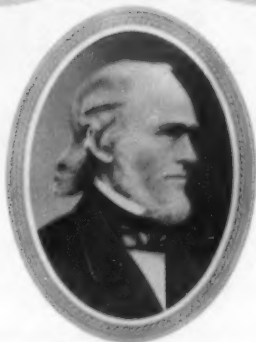
J. A. Jones Construction Co., 209 W. 4 St., Charlotte, N.C. Construct and finance 1,216 housing units (Capehart), Fort Bragg, N.C. for U.S. Eng., 308 Customhouse, Wilmington, N.C. \$16,016,541.

Gerace & Castagna, Inc., 155-10 Jamaica Ave., Jamaica, N. Y. Co-operative apartment project includes 1,200 units in 16 six-story buildings on 15-acre tract at Union St. and Rd., Flushing, N. Y. Linden Towers Apartments, c/o contractor. \$9,500,000.

Baton Consr., 1717 Sansom St., Philadelphia 3, Pa. One-story 483 x 763-ft masonry manufacturing plant, Delair, N. J. for Ford Motor Co., American Rd., Dearborn, Mich. \$8,000,000.

Abell-Howe Co., 53 W. Jackson Blvd., Chicago, Ill. Feed plant at Cedar Rapids, Iowa for Hubbard Milling Co., 308 N. Front St., Mankato, Minn. \$6,000,000.

ALL OF IT STARTED WHEN ICHABOD MET BEN



ICHABOD WASHBURN

*Ichabod, Ichabod, how did you ken
The need for wire when you met Ben?
How did you know you'd not lose your shirts;
That ladies of fashion would hoop their skirts?*



BENJAMIN GODDARD

*Ichabod, Benjamin Goddard and you
Together made some products new.
How did you know that when sales took a drop
Washburn & Goddard would still be on top?*



*Ichabod, Benjamin. You made some dough
And finally merged with a worthy foe.
A. S. and W. now it became,
With products and sales, and world-wide fame.*

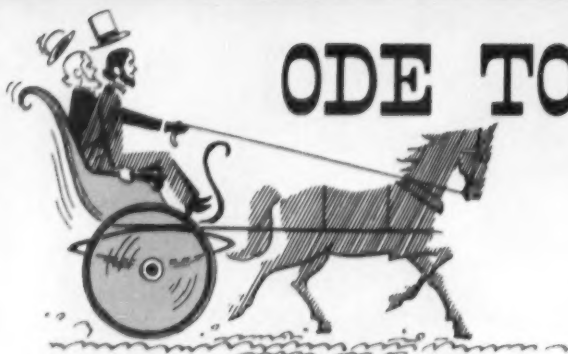
*Times have changed—wire uses, too,
But venerable A. S. and W.
Still remains foremost and best
In wire and wire products from Worcester, west.*



READER: If you would like information on steel reinforcement for concrete,
you might find some on the next page...

AMERICAN STEEL & WIRE DIVISION

UNITED STATES STEEL



ODE TO A ROAD...AND

When Ichabod and Ben used to ride through towns

They bounced and they jounced and they wore big frowns.

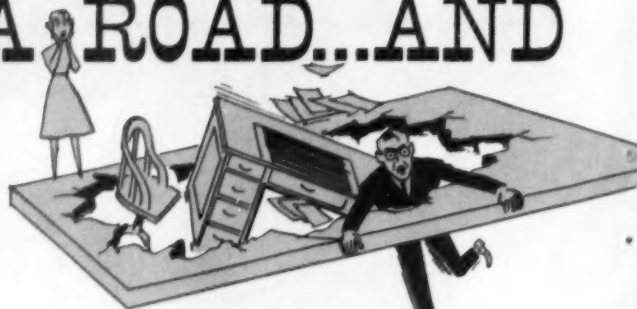
Today, they'd be happy, and free of all ire

On roads made of concrete, reinforced with wire.



Quality American Welded Wire Fabric reinforcement controls cracking, and the longer reinforced concrete slabs provide a smoother riding pavement. Reinforced concrete pavements are 30% stronger than plain concrete pavements of equal thickness. Reinforced concrete pavements therefore last longer. You will find American Welded Wire Fabric adding strength to superhighways in Pennsylvania, Ohio, Indiana, and the City of Detroit. It is used with excellent results in asphaltic as well as Portland cement concrete. It comes in any size and style you need.

USS AMERICAN
WELDED WIRE
FABRIC

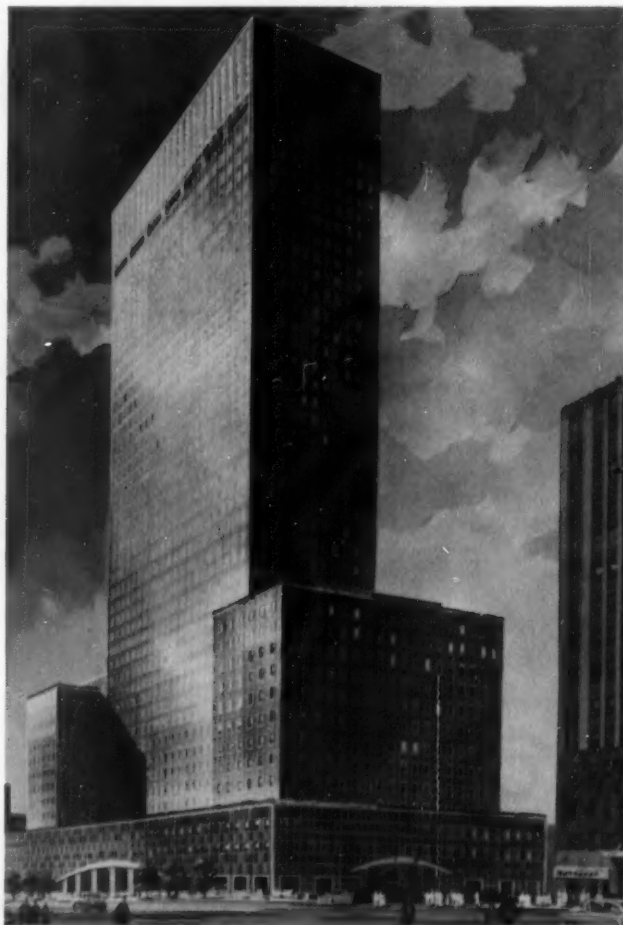


A skyscraper builder by the name of Peter Grim

Forgot wire fabric and learned to his chagrin

That there's not a building tenant who doesn't deplore

An office that's built with a disappearing floor.



You need the extra strength of American Welded Wire Fabric reinforcement in any concrete floor. In beam and slab floors, like those in the Socony-Mobil Building shown above, and in pan and joint floors, American Welded Wire Fabric can be rolled into place quickly and easily . . . comes in any size or style you need.

OTHER THINGS



*There once was a bridge and it didn't need paint,
But collapsed in the river in a plain dead faint;
And so did the builder, all damp and distressed,
His bridge would have stayed if he'd had it prestressed.*

Prestressed concrete now is being used in building floors, roofs, and beams, as well as in bridges. And in the Lincoln Tunnel Retaining Wall, shown at right, prestressed concrete panels form the wall. These panels were pretensioned with American High Strength Stress-Relieved Strand. American Steel & Wire also manufactures Super-Tens Stress-Relieved Wire for prestressing systems that use wire. American Steel & Wire was the first to manufacture a high strength strand for pretensioned, prestressed concrete. We make a complete line of sizes and types in both wire and strand.



OUR POINT IS THIS, *if you can stand some more*

When it comes to wire, we're a general store. For roads, for bridges, no matter what,

Of wire and wire products we've got a lot — So send the coupon without delay;

Just turn this page, and send it today.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL • GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY

USS AMERICAN Super-Tens Stress-Relieved WIRE
— and —
AMERICAN HIGH STRENGTH STRESS-RELIEVED STRAND

Accidents are no joke! Like you
we'd like to stop them all.
Failing that, here's help for you —
Multisafty Cable Guard



SEND THIS COUPON for complete information
about any of the construction materials manufactured
by American Steel & Wire

HOW TO STRENGTHEN AND PROTECT HIGHWAYS

American Steel & Wire

Room 842, Rockefeller Bldg., Cleveland 13, Ohio

Please send complete information on the following products:

- | | |
|--|---|
| <input type="checkbox"/> Multisafty Cable Highway Guard | <input type="checkbox"/> American Welded Wire Fabric for Air-
port Runways |
| <input type="checkbox"/> American Beam-type Highway Guard | <input type="checkbox"/> American Wire and Strand for Pre-
stressed Concrete |
| <input type="checkbox"/> American Welded Wire Fabric for Port-
land Cement Concrete | <input type="checkbox"/> General Catalog on Welded Wire Fabric |
| <input type="checkbox"/> American Road Joints | <input type="checkbox"/> Have your representative call. |
| <input type="checkbox"/> American Welded Wire Fabric for
Asphaltic Concrete | |

Name.....

Firm.....

Address.....

City..... State.....

American Multisafty Cable Highway Guard is made from resilient steel cables, mounted on resilient spring-steel offset brackets. The combination gives vehicles two-way protection: it restrains a vehicle from plummeting off the berm, and cushions the shock of impact between vehicle and guard. It is easy to install, easy to maintain, and lasts a long time. It is the only guard rail that can be designed to provide definite miles-per-hour protection to the automobile driver. American Steel & Wire beam-type guard is also available for highway and parking lot installations.

AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL, GENERAL OFFICES:
CLEVELAND, OHIO
COLUMBIA-GENEVA DIVISION, SAN FRANCISCO,
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SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS MULTISAFTY HIGHWAY GUARD

UNITED STATES STEEL

What GO-power does for you

Adams heavy-duty graders give you extra speed and power...with strength, stability, and control... "GO-power" to do every grader job at the fastest, most efficient rate.



Ditch, blade heavy dirt at 3.2 mph

Adams' extra gear ratios let you match power exactly to load on each grading operation. You get 15 speeds — 8 forward, 4 reverse, 3 optional creepers — almost twice as many power-speed combinations as ordinary graders. And Adams' rugged tandem drive...full-floating rear axle...all-welded one-piece, high-arch, wishbone frame...husky front-end...welded, short-coupled blade mechanism...all provide a sturdy structure to make full productive use of Adams great work-power at high working speed.

Watch an Adams operate. Ride it yourself...put it to work and see how Adams GO-power gives you accurate grades...faster...easier. Then you'll understand why owners

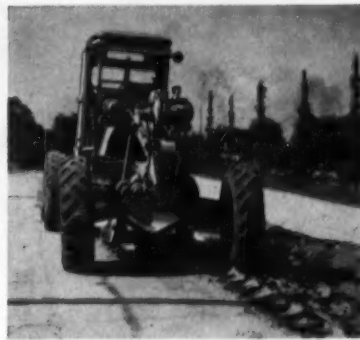
everywhere say you can do more blade-work, more economically with Adams grader.

GO-power in every Adams grader

Visit Adams jobs. Talk to Adams operators. You'll find they have a feeling of confidence...that they know Adams can go-on-thru when going is tough. They know that their machine — with built-in GO-power — can do what they ask of it. Adams operators know they have the range of speed and power to push bigger, heavier loads...the quick, easy control and stability of blade action to cut a little deeper, to work a little faster. With an Adams, your operator will enjoy his job because it's easy to do more work...better work. He'll be happy, and so will you!



Excavate and load up to 700 yd/hr (with Elegrader)



Scarify hard-pan, clay, asphalt, black-top...full-power, slow as 32'/min.

Write for informative booklet "Evaluate Motor Graders"...then compare for yourself. There are 5 grader sizes — 60 to 150 hp with conventional transmission, plus the new POWER-Flow "660" with torque converter and 190 hp. You can count on every Adams for the GO-power to do more work at lower cost.



Push-load self-propelled scrapers



Spread fill at 6.5 mph



Grade haul-roads at 4.6 mph

Adams, POWER-Flow—Trademark AG-1074-G-9



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

Here Now! NEW CHEVROLET

FIRST with the MOST



They're out to save you hours and dollars on any hauling job . . . and they've got big new power plus the modern features that make it a sure thing! They put you way ahead with time- and work-saving advantages you won't find in any other truck today!

Year after year—first with the most modern features! And again, for 1957, Chevrolet brings you the industry's most advanced truck features—new developments that have already been proved in a history-making preannouncement test run! (See below.)

For '57 there's bold new styling—rugged good looks to match Chevy's remarkable stamina and dependability. There's new

Alcan Highway Test Run Proves Chevrolet Ruggedness!

In an AAA-certified endurance run, 6 new Task-Force trucks roared up the 1,520-mile Alcan Highway (normally a 72-hour run) in less than 45 hours! In dramatic fashion, new Chevy trucks conquered one of the world's most challenging roads and proved their greatness!



A



TASK-FORCE 57 TRUCKS!

modern features



fleet-action power in Chevy's outstanding new engine line-up—with the 195-h.p. Loadmaster V8 standard in all 9000 and 10000 series trucks; and the sensational new 283-cu.-in. Taskmaster V8 (160 h.p.) standard in 5000, 7000 and 8000 series models. All told: *five* high-efficiency V8's and *three* economy leader 6's in the truck line alone!

Many models are equipped with bigger,

brawnier rear axles. And there's a load of heavy-duty options for '57 — including Chevy's revolutionary 6-speed Powermatic transmission, designed especially for heavy-load, high-mileage hauling.

Your Chevy dealer has all the details. When you see him, be sure to check the new cab features, too. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

The "Big Wheel" in trucks!



B



C



A. Cameo Carrier covered entire distance without stopping engine; averaged 18.17 miles per gallon!

B. New Super Taskmaster 283 V8 stole the power show, flattening an obstacle course of mud, gravel and grades!

C. 1,520 miles without shifting gears! Powermatic equipped heavyweight went all the way in a single forward-speed range!

Washing a bridge used to be dangerous business

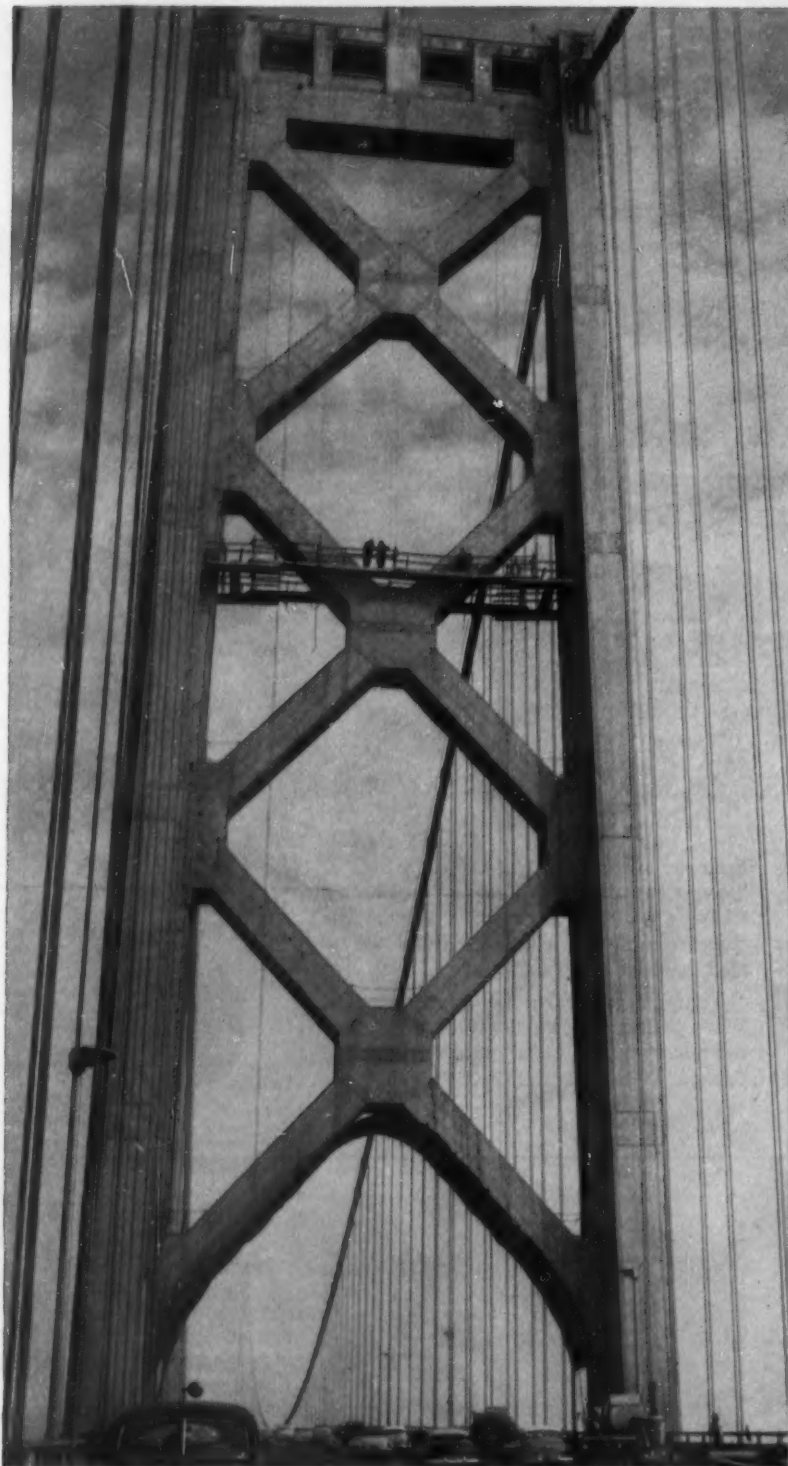


Photo: San Francisco-Oakland Bay Bridge. High-pressure cleaner made by Malabery Manufacturing Co., Oakland, Calif.

A typical example of B. F. Goodrich improvement in rubber

ONE of the little black lines you can hardly see in the picture, running up to the scaffolding where the men are, is a piece of equipment that used to be very dangerous—a steam hose that could burst!

Workmen wash off dirt, salt and grease with high-powered streams of superhot solution before painting. But heat used to weaken steam hose. It sometimes burst with explosive force, spraying scalding steam, seriously injuring workmen.

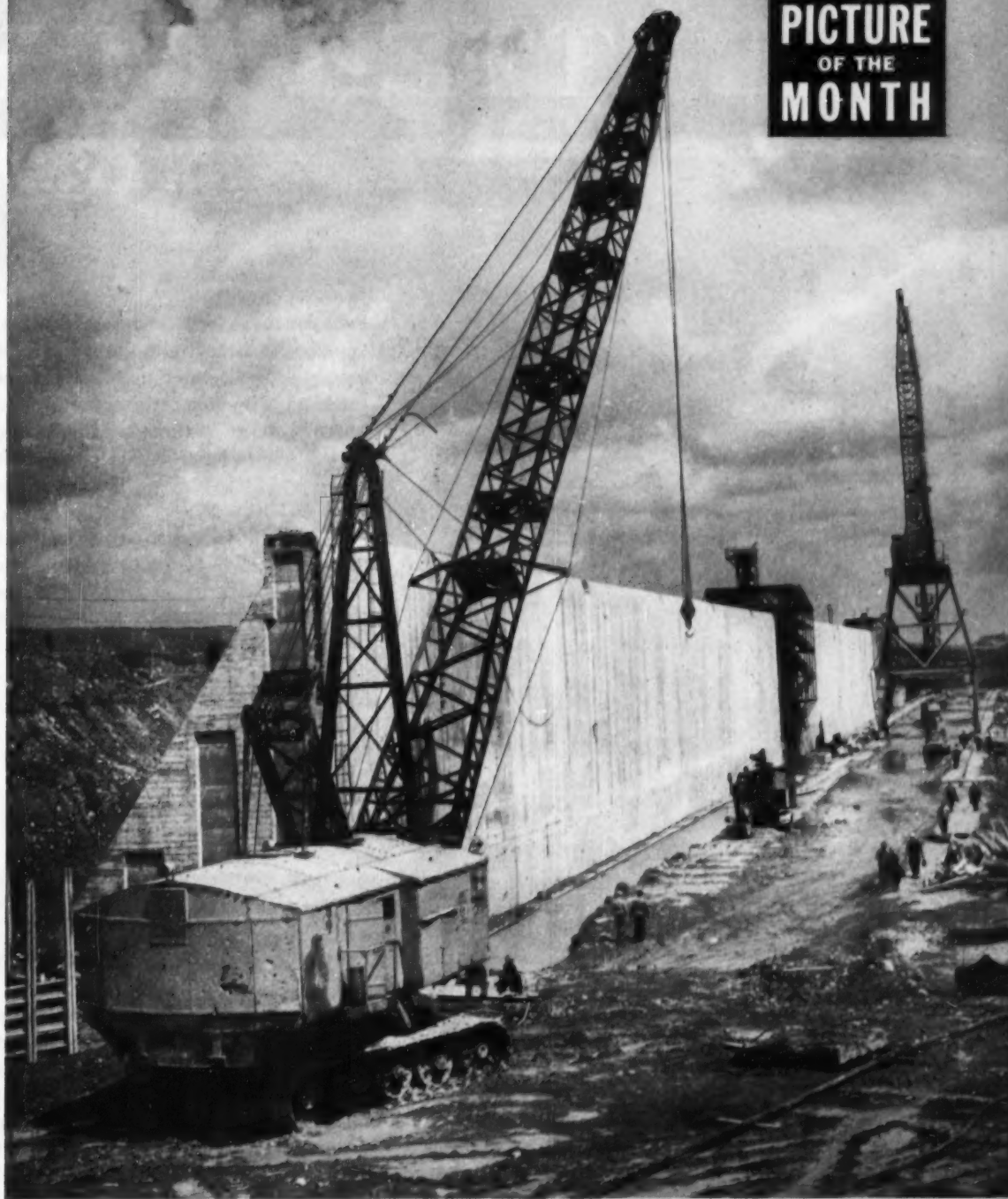
B. F. Goodrich men wanted to make a hose that was completely *burstproof*. They developed a new kind of heat-resisting rubber which they used inside the hose, and between the plies. Then they developed layers of fine braided steel wires for reinforcement.

The hose lasts longer than any steam hose ever made before. Not one length has ever been known to burst. Even if a hose wears out after years of service, steam can leak out but it cannot explode. This B. F. Goodrich hose is 30 per cent lighter than steam hose used to be. It's more flexible, easier for workmen to handle. Its rubber cover stands more scuffing, resists abrasion better than steel.

Your B. F. Goodrich distributor has exact specifications for the B. F. Goodrich hose used in this bridge-cleaning job and exact specifications for products featured in dozens of other B. F. Goodrich success stories. B. F. Goodrich makes conveyor belting, V belts, flat transmission belts, hose to carry air, water, gasoline, paints, chemicals, even dry materials such as flour, cement or brick chips. If you don't know your nearest distributor, write B. F. Goodrich Industrial Products Co., Dept. M-795, Akron 18, Ohio.

B.F. Goodrich
INDUSTRIAL PRODUCTS

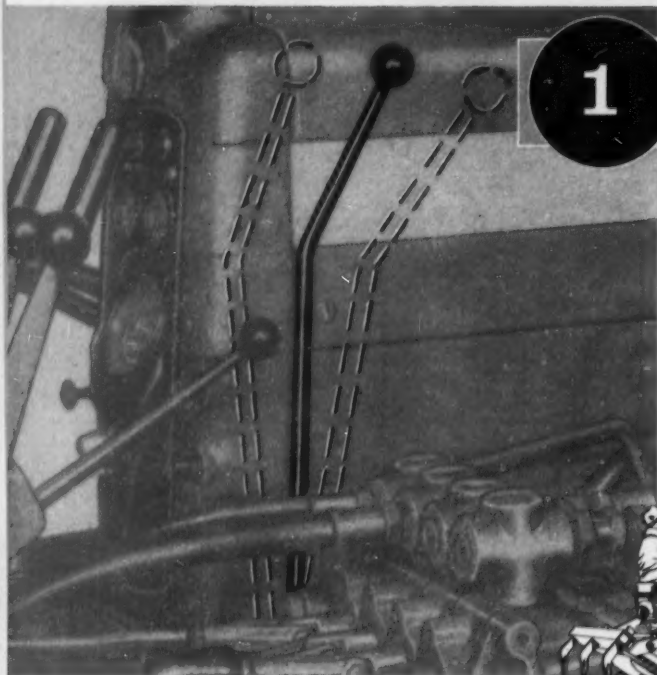
**PICTURE
OF THE
MONTH**



Seaway Structure Goes Up

• Upstream approach wall to Iroquois Lock on the St. Lawrence Seaway is about half completed. The massive concrete structure is 47 ft high, 34 ft wide at the base, and 6 ft wide at the top. It will extend more than 3,000 ft when completed. Trucks bring concrete to the site from mixing plant visible just above the forms. A gantry crane and a big crawler crane place the concrete from 2 and 4-yd buckets. The lock and its approaches will require a total of 300,000 cu yd of concrete. Pentagon Construction Co. and Iroquois Constructors are building the lock and its approaches under a \$6.5 million contract with Canada's St. Lawrence Seaway Authority.

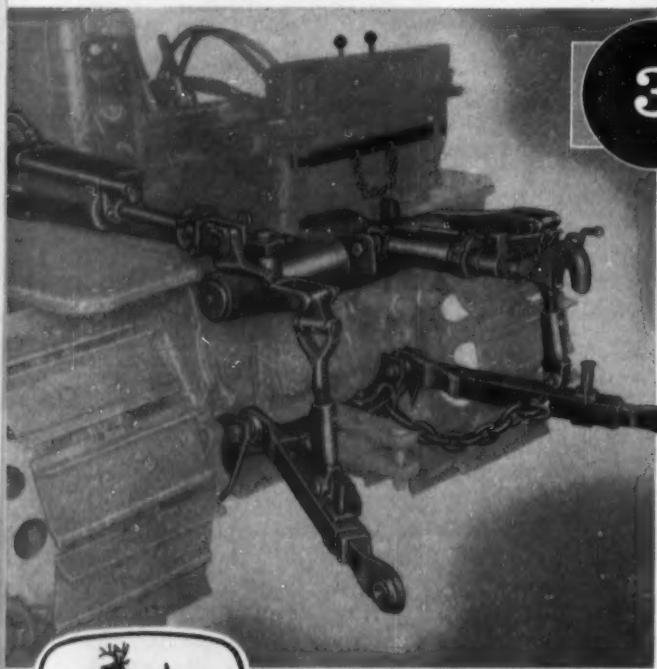
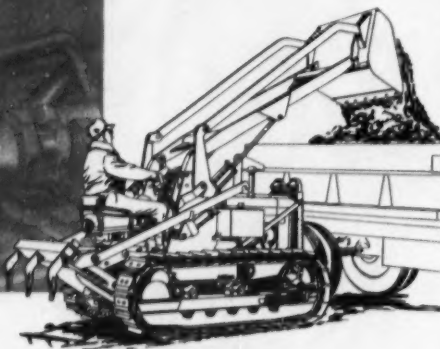
Now THESE New *Time-Savers* Make **BETTER BUYS**



1

Time-Saving DIRECTION REVERSER for "420" Crawler and "420" Utility Tractors

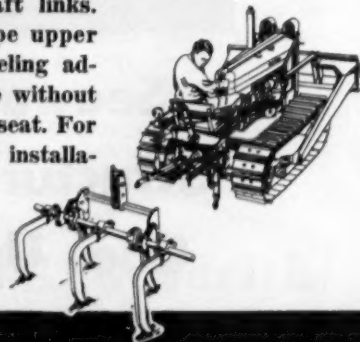
Lets you move forward or backward in the same speed—no time wasted shifting gears. You simply depress clutch pedal, stop tractor, move the handy direction reverser lever, release clutch and off you go in the opposite direction. Detail at left shows lever in neutral position. Dotted lines show reverse and forward travel positions. Available as optional equipment on "420" Crawler and Utility models.



3

Heavy-Duty 3-POINT HITCH for John Deere Crawler Tractors

Offers you the advantages of "pick up and go" operation with a track-type tractor. You change tools such as rotary cutters, scarifiers and integral scrapers in minutes, raise and lower them hydraulically at a touch of your hand on a convenient lever. Heavy-duty construction. Telescoping draft links. Turnbuckle-type upper hitch link. Leveling adjustments made without leaving tractor seat. For factory or field installation on John Deere "420" or "40" Crawlers.



JOHN DEERE *Quality-Built*

John Deere Industrial Tractors THAN EVER !

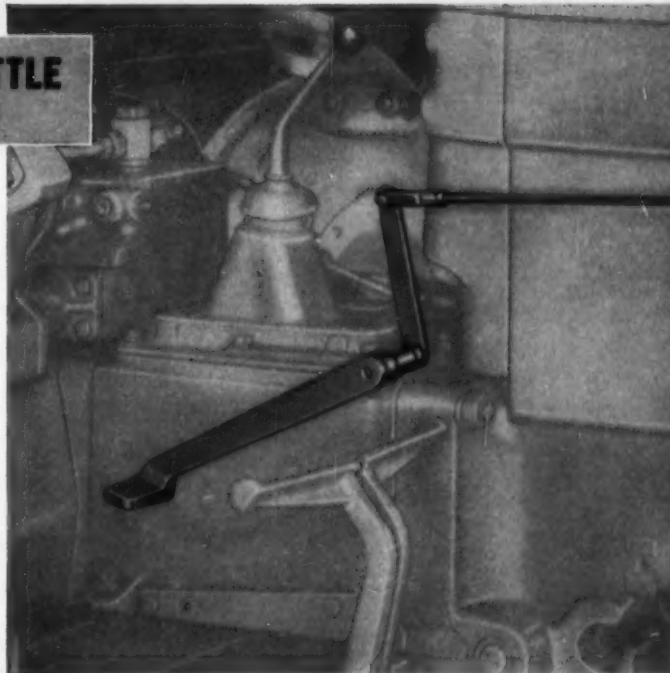
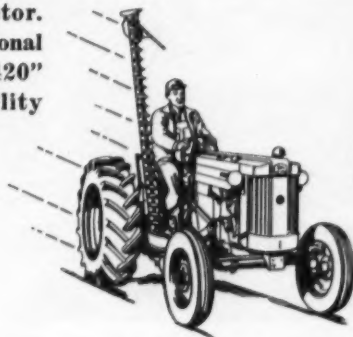


2

Time-Saving FOOT THROTTLE

for "420" Crawler and "420" Utility Tractors

Provides you with foot control of engine speed. Operates in conjunction with hand throttle to increase engine speed, and consequently ground-travel speed, approximately 25 per cent—makes possible speeds up to 17 mph on the highway. Also helpful when maneuvering in close quarters. Inexpensive. Easy to attach to tractor. Available as optional equipment for "420" Crawler and Utility models.

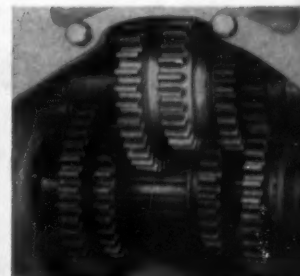
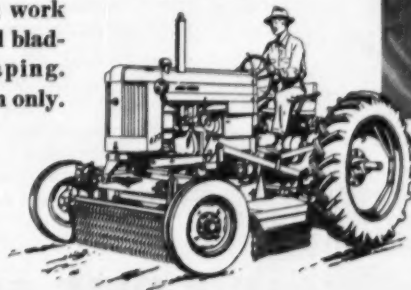


4

5-SPEED TRANSMISSION

for "420" Crawler and "420" Utility Tractors

Gives you an extra speed forward for increased versatility in many operations. On Utility tractors, the new speed is $6\frac{1}{4}$ mph and on the Crawler, $3\frac{7}{8}$ mph. Regular forward speeds are: Utility $1\frac{5}{8}$, $3\frac{1}{8}$, $4\frac{1}{4}$, and 12 mph; Crawler $\frac{7}{8}$, $2\frac{1}{4}$, 3, and $5\frac{1}{4}$ mph. Quickly repays its small extra cost on such work as mowing, finished blading, and landscaping. Factory installation only.



Showing 5-speed gearshift pattern (left) and view into transmission case (above).

Industrial Tractors

AND EQUIPMENT

SEND FOR FREE LITERATURE

John Deere Industrial Div., Moline, Ill., Dept. D19E

Please send me your illustrated booklet on John Deere Industrial Tractors and Working Equipment. Include name of nearest dealer.

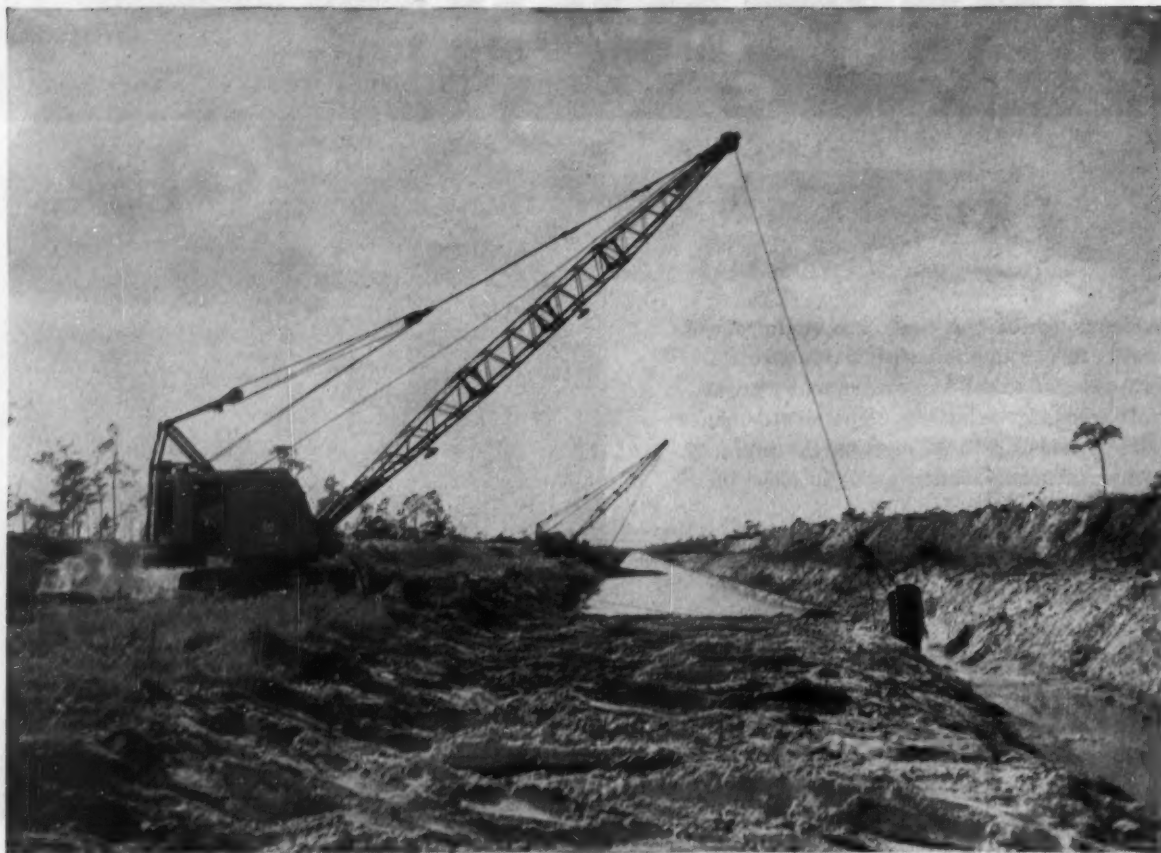
Name _____

Title _____

Address _____

City & State _____

It's time to compare...with LINK-BELT SPEEDER



As a dragline, shovel, hoe or crane a Link-Belt Speeder provides new opportunities to step up production schedules and profits.

No other machine can touch it for fast, effortless control... easily responsive brute power... stamina and low maintenance.

New way to measure shovel-crane efficiency

Link-Belt Speeder completely revises existing production standards. It's the only line with true power-hydraulic controls, up to 40% more usable hp!

With competition getting rougher, can you afford to think in terms of outdated production standards? If you aren't using a Link-Belt Speeder—it's hard to realize just how much more production... more usable net horsepower these new shovels, cranes and hoes offer.

Speed-o-Matic power hydraulic controls—a Link-Belt Speeder exclusive—make every move fast, sure, easy. With them, you can boost output—often as much as 25% or more!

From track treads to boom tip

... every detail of a Link-Belt Speeder reflects advanced engineering, skilled craftsmanship, pre-

cision construction and quality materials.

Check this list of a few standard and optional features—independent swing and travel... independent rapid boomhoist... torque converter... third drum... reversing clutches for both hoist drums... and hydraulic-actuated swing brake.

It's good business to compare now! See why more and more Link-Belt Speeder owners have completely revised their thinking on how fast a job will go. Your distributor will be pleased to arrange for you to see a new Link-Belt Speeder in action, give you the facts. Call him now! Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

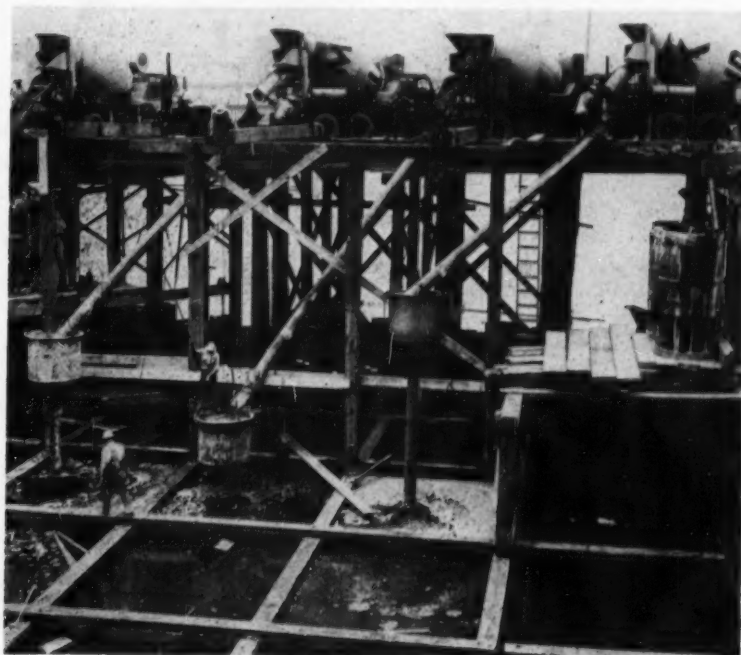
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LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes... with exclusive Speed-o-Matic power hydraulic controls



Construction News in Pictures . . .



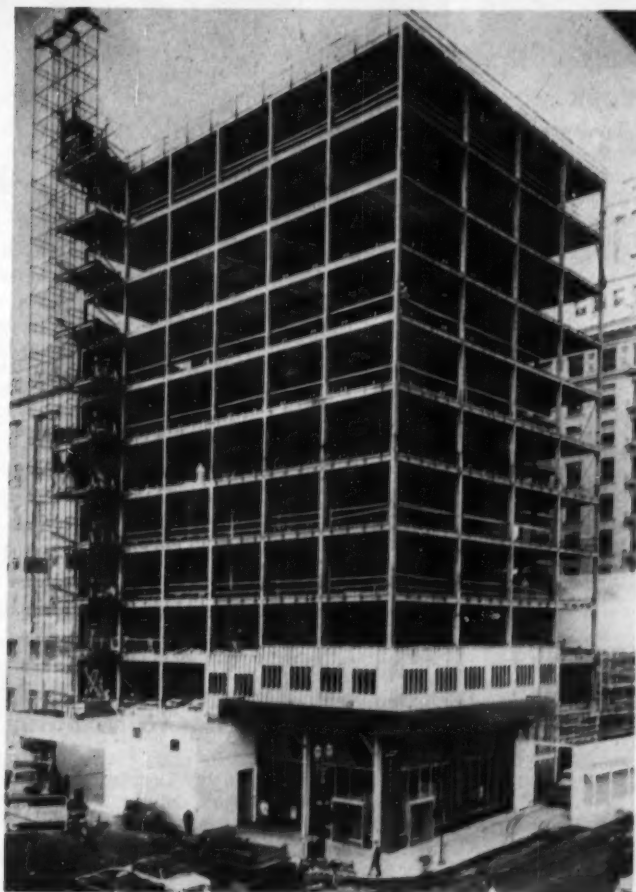
Fast Pour

Mixer trucks discharge into tremies at a top rate of 240 yd per hr in pour for Pier No. 2 of the Morrison Street Bridge in Portland, Ore. At the peak of the operation, a fifth truck fed into buckets on the platform at right. Manson Construction Co., Portland, completed the entire 5,600-yd pour in just 33 hr.



Trussless Steel Roof

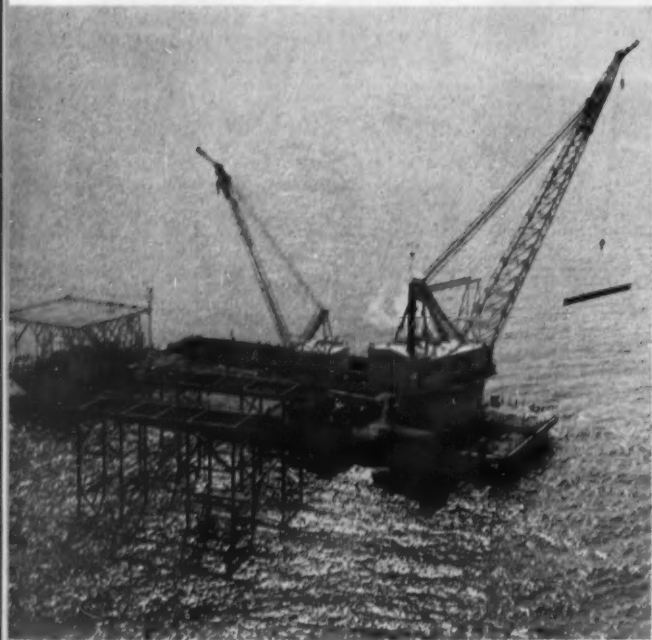
Roof deck of new coliseum in Phoenix, Ariz., consists of curved 18-gage galvanized steel sheets 2 ft wide and 6 to 10 ft long bolted together to form self-supporting arches. The roof provides a 260x120-ft clear span, making it the world's largest trussless steel roof. Wonder Building Corp., Chicago, fabricated the steel.



Growing Pain

This 11-story building in Portland, Ore., started out to be only eight stories high. Plans were changed after construction had started. But Hoffman Construction Co., Portland, was able to erect the larger building on the original footings by using lightweight perlite plaster on the superstructure to cut deadweight.

Continued on next page



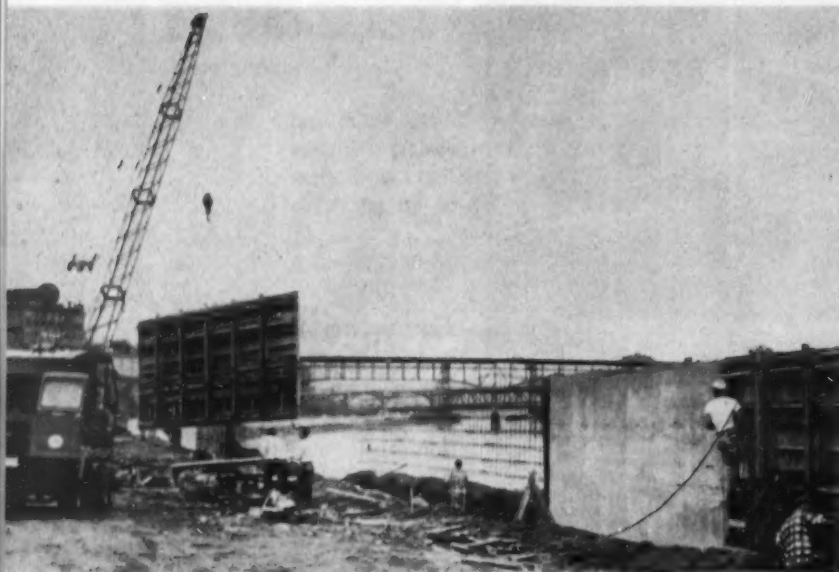
For Heavy Work

Humble Oil Co.'s new construction barge mounts two American cranes to speed building and dismantling offshore drilling platforms. The big crane has a 220-ft boom and a lifting capacity of 250 tons. The smaller 45-ton crane has a 115-ft boom.



A Record

Crack wire spinning crews of U.S. Steel Corp's American Bridge Div. worked two shifts a day to spin suspension cables for the Mackinac Bridge in just three months. The same crews spun the cables for the Walt Whitman Bridge across the Delaware (CM&E Mar., '56, p. 58).



Easy to Handle

With gang forms of prefab panels, Hurley Construction Co. of St. Paul, Minn., pour a 2,400-ft retaining wall along the Mississippi River in St. Paul at a rate of 140 ft per day. A Shield Bantam truck crane places and strips the Symons forms.



Berger Transit narrows problems on world's widest vehicular tunnel

Deflections. Angles. Curves. Each construction job contributes its share. But the 13½ million dollar tunnel section of Boston's new J. F. Fitzgerald Expressway had them in spectacular abundance. And when V. Barletta Co. of Roslindale, Mass., was awarded this big contract, they knew that the instrument needed to see them through the job would have to be tops in accuracy and dependability. That's why they chose the BERGER 6¼" Bronze Transit.

Here's an idea of some of the problems they met:

On the approach to the slab area, some 20,000 yards of concrete—over 90 separate pours—were held to within 1/100th of a foot.

Where the approach goes underground, the base lines of the steel structure are on a series of curves. These base lines—and all points on both sides of the structure—were run 15 to 20 times to assure absolute accuracy.

Anchor bolts were set within 1/16". Pre-cut steel beams had to fit exactly. They did.

Problems of laying out, alignment, elevation, leveling—the BERGER Transit was given a complete workout, day in and day out.

Said Barletta Co. engineers: "It does the job—and then some. Graduations stand out clearly for easy reading. Telescope focuses quickly over long and short distances—from 100 to 500 feet in only half a screw turn. Easy to center over a point from 15 to 20 ft. height. No problem picking up targets—even at 1200 feet."

Where accuracy is at stake, leading engineers and construction men buy BERGER. Put yourself behind a BERGER—and see why. C. L. BERGER & SONS, INC., 53 Williams St., Boston 19, Mass.



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ENGINEERING AND SURVEYING INSTRUMENTS...SINCE 1871



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Armco Drainage and Construction Products are specially designed for fast, efficient installation with a minimum of job-site labor. Check below for a partial list of dependable Armco Products.



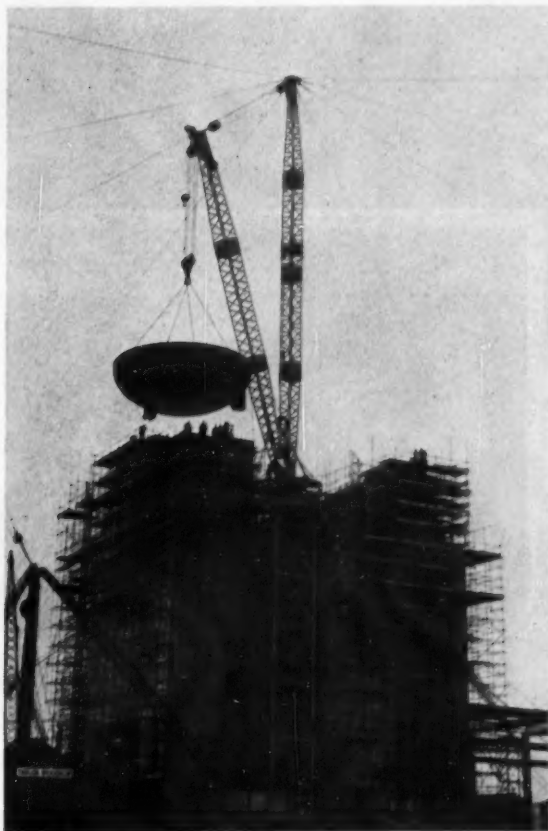
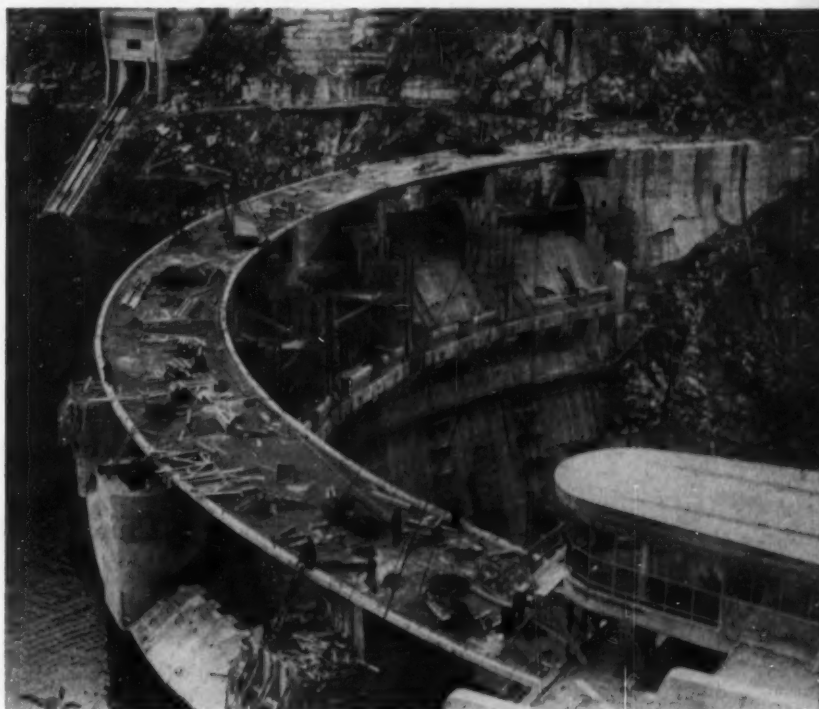
Armco Corrugated Metal Drainage Structures	
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Other Armco Products include Water Control Gates, Beam-Type Guardrail, Corrugated Bridge Plank, Steel Water Pipe, Steel Buildings. Write us for details. Armco Drainage & Metal Products, Inc., 4386 Curtis St., Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Construction 'Round the World ...

In Yugoslavia

Jablanica Dam, key structure in a big hydro-electric project backed by the United Nations, is nearing completion after 10 years of work. The dam is 273 ft high and 683 ft in length along the crest. A roadway above the dam will form part of the highway between Mostar and Sarajevo. Part of the electricity produced will be exported.



In Switzerland

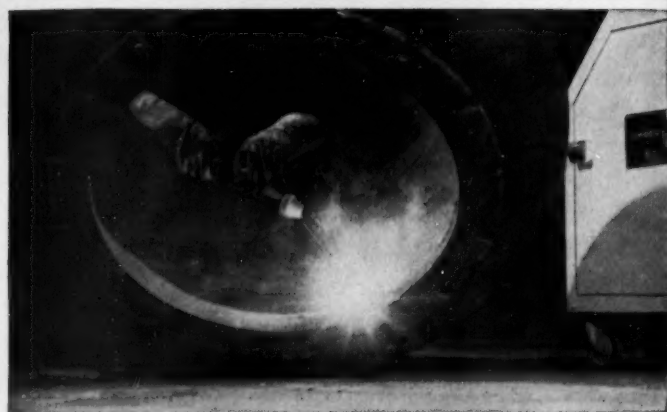
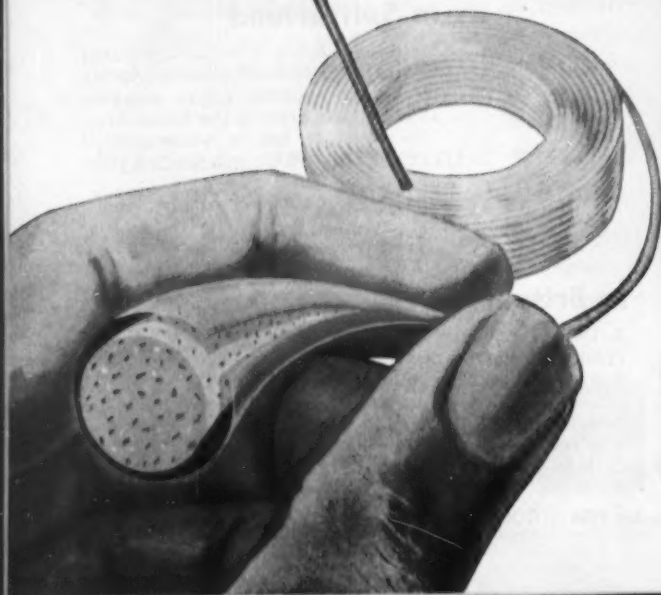
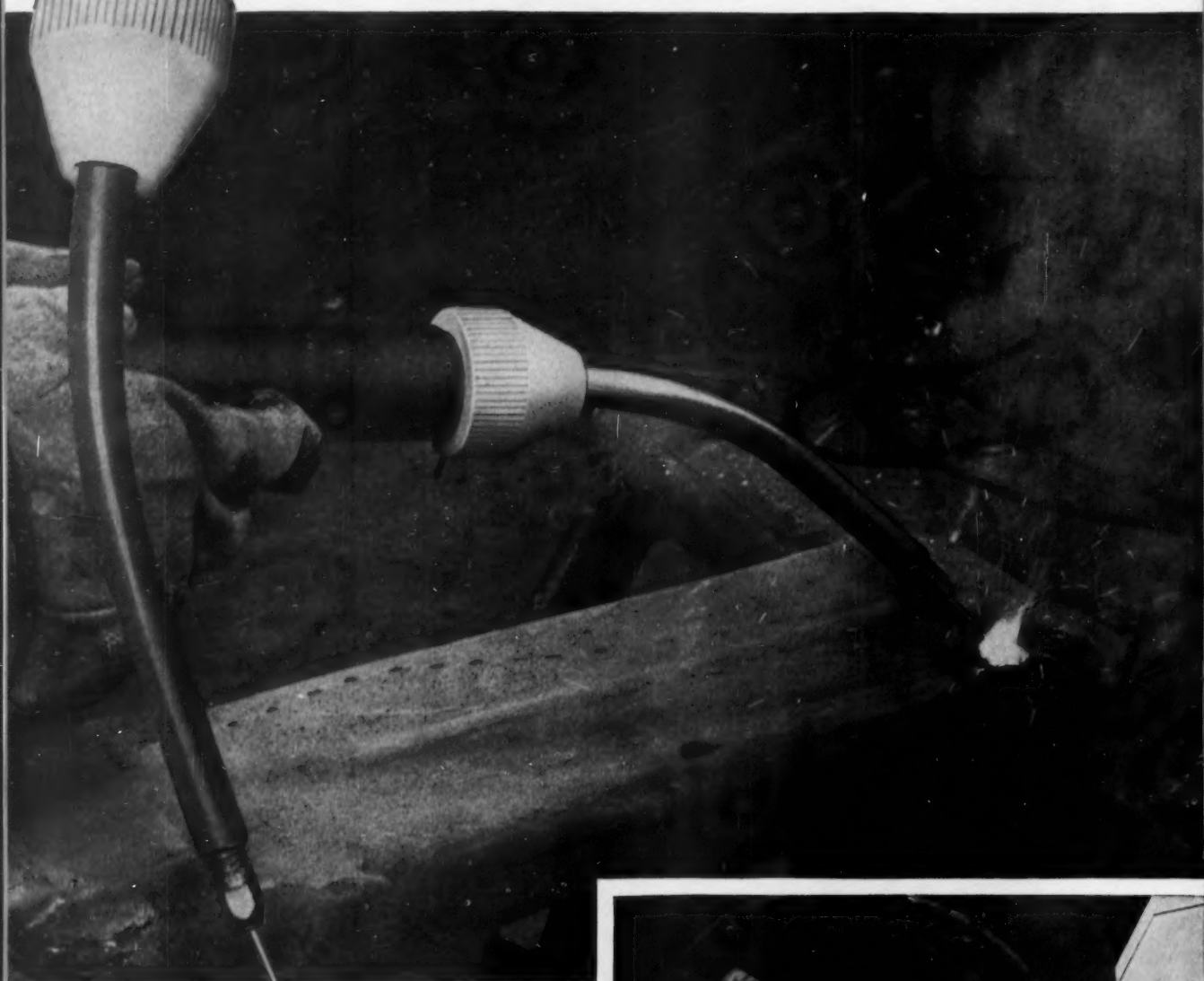
Four big electric vibrators mounted on the dozer arms of a small crawler tractor consolidate dense concrete at Mauvoisin Dam in the Swiss Alps. The concrete has a water-cement ratio of only 0.6. Contractor is a joint venture of five Swiss firms.

In Britain

A 150-ton guy derrick, largest ever erected in Britain, lifts a 100-ton section of the steel reactor vessel for the world's first commercial atomic power plant. Calder Hall went on line last month. It is the first of 12 nuclear plants Britain will build.

Announcing the NEW

AMSCO



In build-up of a worn pump shell with AMSCO Tube Rod, welding time was cut 50%

◀ The perfect uniformity of AMSCO Tube Rod insures smooth, trouble-free feed to the work. Note hardfacing alloy compactly enclosed within the steel tube.

TUBE RODS

... specially designed for FASTER, EASIER semi-automatic HARDFACING

Here's a new, improved Tube Rod... *specially designed and engineered* for semi-automatic hardfacing! It has *proved* its speed, quality of weld and uniform deposit in actual use-tests. In many cases, deposition rate has been increased up to 200% over other types of semi-automatic rod.

Amsco Tube Rod is easy to use... an inexperienced man can handle it with practically no training! It cuts down operator-fatigue, thus increasing productivity and reducing welding costs.

Amsco Tube Rod is a perfectly symmetrical, steel-wire shell, with the various alloys firmly enclosed within the wire, for proper weld-deposit. The steel shell is work-hardened to provide a rod that will not deform or snarl during welding... that is simple to drive with conventional feed rollers. Also, the rod is *automatically lubricated*, to insure constant and uninterrupted feeding to the work.

Three types of Amsco Tube Rod are available for semi-automatic welding, in $\frac{1}{8}$ " diameters only:

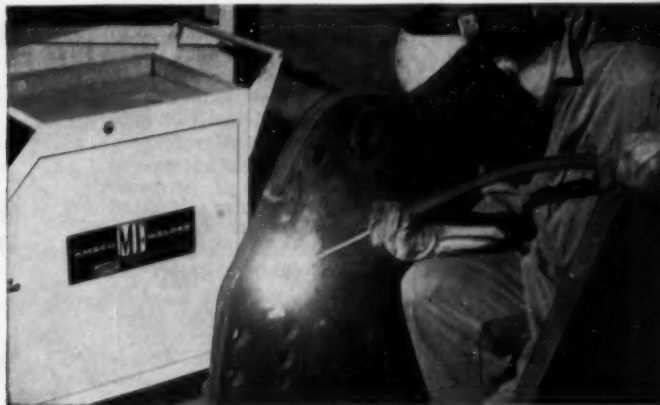
- *S/A Manganese Steel*—for all types of manganese steel build-up and repair applications.
- *S/A-53*—a high chromium alloy for general-purpose hardfacing.
- *S/A-33*—for wear resistance in severely abrasive applications.

Amsco Tube Rod is ideally suited for use with the AMSCO MF Semi-Automatic Welder... the most versatile and flexible welding machine for all types of shop and field applications. Or, by applying an inexpensive adapter, Amsco Tube Rod can be used with any semi-automatic machine.

For additional information and technical data on Amsco Tube Rod, see your Amsco Welding Distributor. Or write to Amsco Welding Department SA, Chicago Heights, Ill.



Build-up of a dipper base is much easier and faster with AMSCO's method of tube-rod welding.



Hardfacing the side of a backhoe bucket with AMSCO Tube Rod. Note ease of use for vertical welding in tight quarters.

Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.



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Here's a "natural" for any product requiring dependable power *plus* the means of automatically increasing *work ability* throughout the engine's speed range.

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Chrysler Industrial Torque Converter is assembled with the Chrysler Industrial Engine of the manufacturer's choice. The combination may be ordered Chrysler-equipped for use with direct drive, transmission or power takeoff. Manufacturers may also specify high or low inertia flywheel—whichever best meets their requirements.

Check this power combination—Chrysler Industrial Engine (230 to 331 cubic inch displacement, in-line 6 or V-8), plus Chrysler Industrial Torque Converter. For more details see a Chrysler Industrial Engine Dealer, or write: **Dept. 811, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.**



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Chrysler INDUSTRIAL ENGINES

Construction Methods AND EQUIPMENT

NOVEMBER, 1956

VOLUME 38 • NUMBER 11

HENRY T. PEREZ, Editor

The Contractor And the Public

WHY IS IT that construction company activities go relatively unnoticed in the general press until something goes wrong? It would seem that the adage has been reversed to read, "Good news is no news." Let a contractor finish a job ahead of schedule or at a saving in cost, and the awarding agency gets the credit. Newspapers take little, if any, notice of the people who actually did the job. But just let there be some trouble or delay, whether beyond the contractor's control or not, and you know who's blamed.

This situation is unfair, of course. Yet often construction companies themselves are in large measure responsible for their poor press. Too many of them, instead of trying to establish good public relations, take a public-be-damned attitude. Streets are torn up and left open for long periods of time, then poorly repaired. Building materials are piled haphazardly on sidewalks, causing inconvenience to pedestrians. Trucks hauling dirt dribble material all over streets and highways. Blasts are set off without proper warning to nearby residents. Detours are inadequately marked. And so it goes.

Deficiencies like these are easily corrected, and should be. Nevertheless, that is only a negative approach to good public relations. Positive action is called for to weld the public solidly in your favor.

Some progressive contractors go to great lengths to do this. One, justly proud of his new portable aggregate plant, recently spent thousands of dollars to set it up and demonstrate it at his state fair (photo).

But developing good public relations need not be so complex or costly. One simple way is to take the public into your confidence—explain what you are doing and why the job must be handled this way. A person who is aware of the long-range benefits of a project is less inclined to become irate over the inconveniences it may cause during construction. Explanations can be given by signs on the job site and by advertisements or articles in local newspapers. They can be supplemented by talks at schools and service clubs, on radio or television.



AT NORTH CAROLINA STATE FAIR, Nello L. Teer Co. shows off its new 250-tph Telsmith portable aggregate plant to the public. It's one of many ways to build good public relations.

Many builders make it easy for the public to view the work in progress by providing grandstands or portholes in the site fence. One imaginative contractor even piped in an explanatory recording to a loudspeaker at each hole.

But there are more benefits than just upgrading your company in the eyes of the public, and possible future clients, by these and other means. Not the least of the advantages is that your company name, remembered favorably, will help you attract better men. And the pride in company that good public relations can develop will help you keep them.

On a broader front, good public relations will help change the attitude that construction is a fly-by-night, roughneck business—an attitude still held by too many uninitiated persons. Perhaps contractors have been too modest in not bragging about their work. But this is no time for modesty. It is just plain good business sense to sell yourself—and the industry—to the public.



WHIRLER and double-cantilever cranes place concrete for base of 700-ft-high dam in northern India. Thousands of natives labored years to get job started. They drove two diversion tunnels and scaled steep canyon walls to remove overburden.

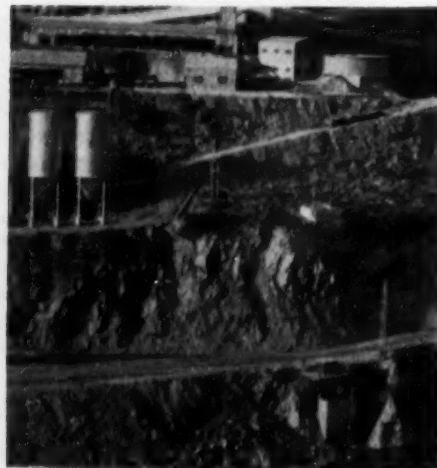
Bhakra Dam Aiming For Placing Rate of 200,000 yd a Month

ONE OF THE MOST MODERN construction plants ever assembled is pushing India's Bhakra Dam at a record pace. Concrete placing is swinging into high gear and will soon reach the rate of 200,000 yd a month. The job requires 5,400,000 yd to be placed within a 1,000-working-day time limit.

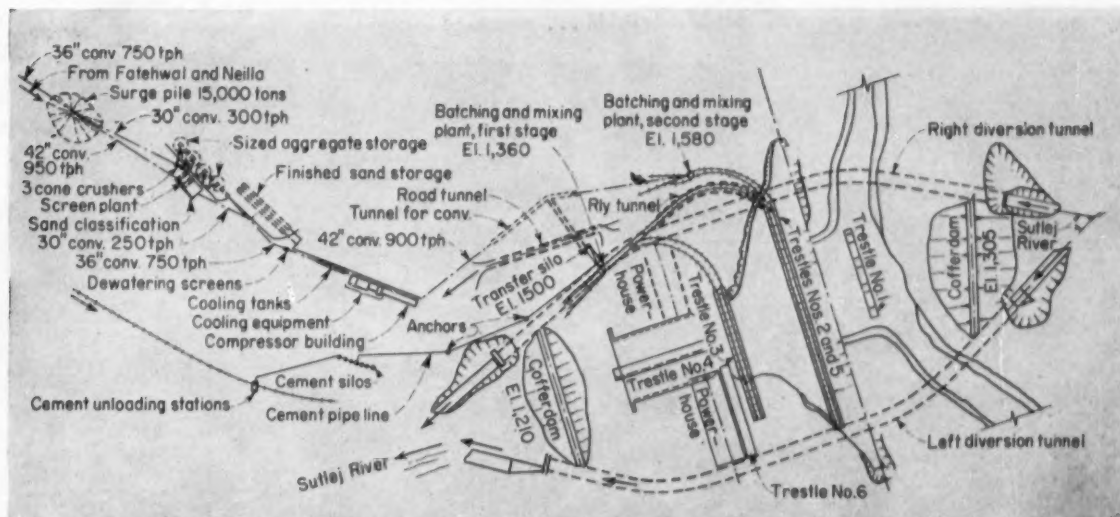
Located in northern India at the doorstep of the Himalayas, the 700-ft high dam is rising across a steep canyon. All work is in the dry, now



AGGREGATE processing structures hug side of hill. Conveyors carry material from surge pile through screening and cooling plants. Other structures are shops and warehouses.



SUTLEJ RIVER emerges from right diversion tunnel and flows past construction plant.



ULTRA-MODERN PLANT processes natural river deposits and conveys aggregates through tunnels to batching and mixing plant.

Concrete buckets are hauled in transfer cars to crane-mounting trestles. Because of terrain, conveyors proved indispensable.

that the mighty Sulej River is bypassing the site through two 50-ft dia diversion tunnels.

Leading a construction team composed mostly of Indians is California's Harvey Slocum, known throughout the industry as "the best dam man in the world." Slocum admits that Bhakra is perhaps the toughest dam he's tackled. It requires a tremendous amount of rugged excavation, an extensive aggregate preparation plant, and a complex framework of trestles for placing concrete. Unfortunately, supply lines are poor.

Diversion Tunnels

Indian crews moved into the site in 1948 and began construction of two 50-ft dia diversion tunnels

each $\frac{1}{2}$ mi long. But the going was rough. Working from upstream and downstream faces, they drove pilot tunnels first and then enlarged the ring. Strata varied from sandstone to siltstone, with intermediate pockets of claystone. Much heavy shoring was required.

After five years, the tunnels were completed, upstream and downstream cofferdams were built, and Harvey Slocum arrived with an array of modern rock and earth-moving equipment.

Up to this time, excavation had been limited to stripping canyon walls, mostly by hydraulic methods. But as soon as the site was dry, Slocum's equipment started gnawing away at the 7,000,000 yd of excavation.

Power shovels with buckets up to $5\frac{1}{2}$ yd teamed with a large group of drills, dozers, and trucks to move the bulk of excavation in only 22 months. Volumes of rock shot at one time varied all the way from a few yards in the final stages to 200,000 yd in abutment areas. The biggest shot, using coyote tunnel methods, consumed 89 tons of explosives. Muck was dumped in several areas around the site to provide material for access roads, plant areas, and overlooks.

But it took more than equipment to excavate abutments in the steep gorge. Thousands of natives labored on hazardous cliffs to clean canyon walls. Later, as excavation approached final grade, they

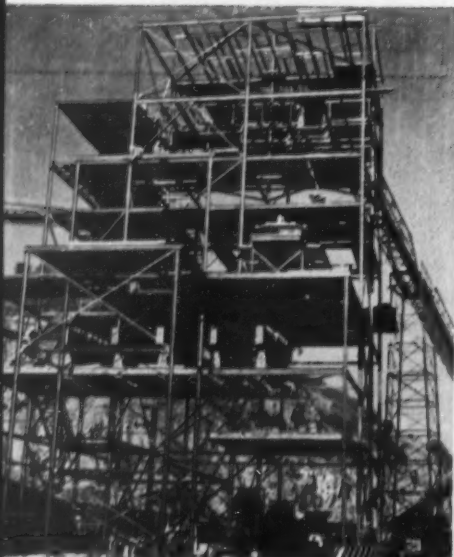


Aggregate conveyor passes through hill and emerges over concrete mixing plant.



FLOOD bypasses dam site through two diversion tunnels. Deep foundation requires about 7,000,000 yd of excavation. In distance, note river behind upstream cofferdam.

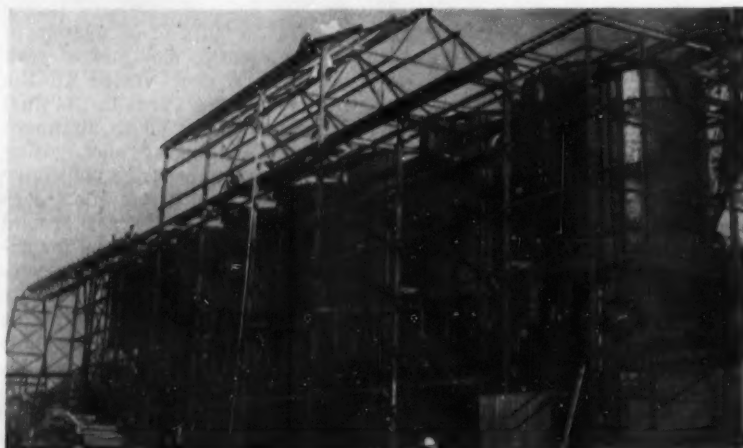
BHAKRA DAM ... Continued



SCREENING PLANT mounting series of double-deck units is fed by 42-in. conveyor.



FINISHED SAND STORAGE is handled by overhead stockpiling conveyor. Sand is brought in at 250 tph from rake-type classifier. Big aggregate conveyor is in background.



EIGHT TANKS cool immersed aggregates to assure concrete placement temperature of 65 deg. Plant with 1,800 tons of refrigeration handles cooling. Conveyors are insulated.



CONCRETE PLANT with capacity of 320 yd per hr is fed aggregates by tunnel conveyor. Cement is pumped to plant from six storage silos, each having capacity of 840 bbls.

worked with jackhammers and crowbars stripping the foundation area without disturbing the supporting bedrock.

Aggregates

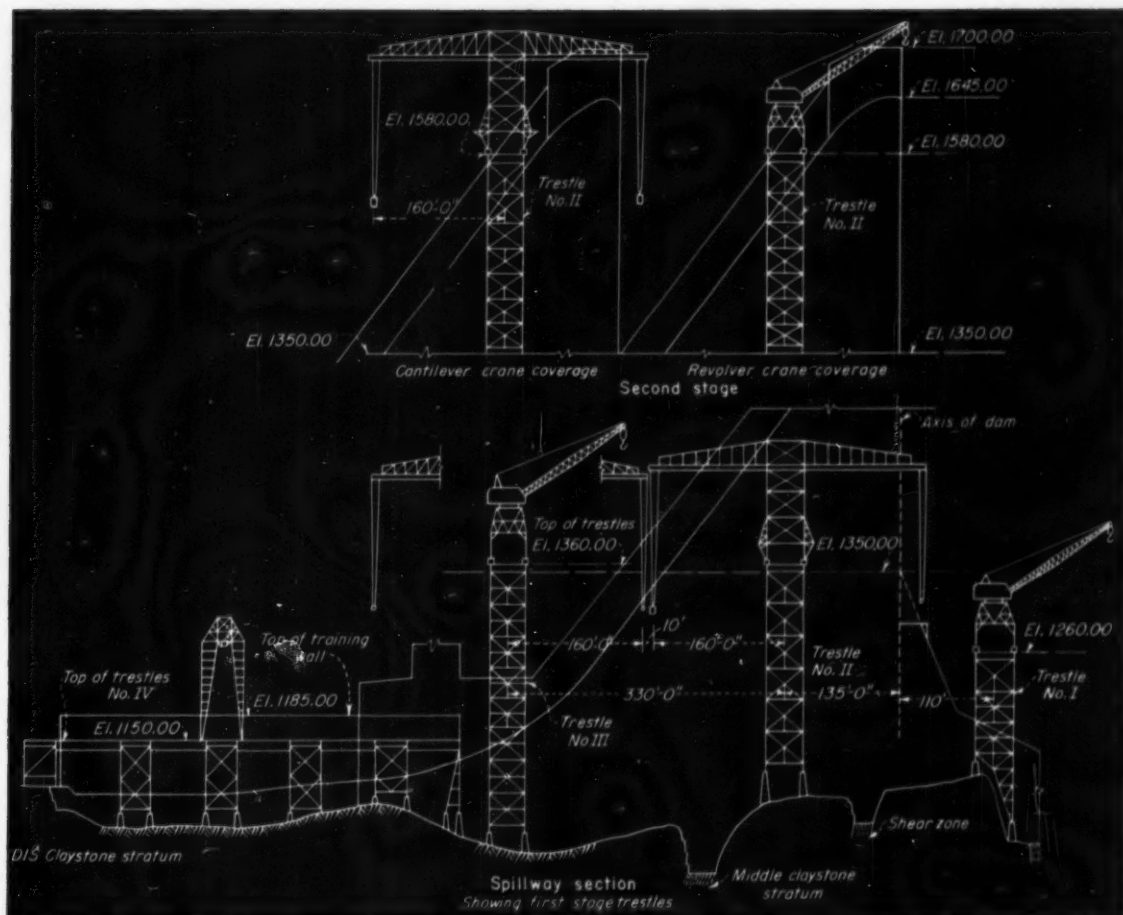
The spotlight now has turned to the massive job of producing and placing concrete. About 12,000,000 tons of aggregates are required. They are quarried from natural river deposits at two sites about 3 mi from the dam and are transported by belt from the source to the processing plant.

At both sites, shovels and draglines load fleets of rear-dump trucks which haul to grizzlies mounted over vibrating feeders.

Raw aggregate is hauled to the main surge pile on a 36-in. conveyor 9,352 ft long. Its seven flights move 450 fpm and transport material at the rate of 900 tph. Flights are interlocked so that they halt automatically in case of stoppage.

A 950-tph processing plant screens aggregates, classifies sand, and makes up differences by control crushing. Atop the 115-ft high plant, aggregate is processed by two 6x12-ft double-deck screens which scalp off 3-in. stones. Below, four 5x12-ft double-deck screens separate smaller sizes. Sand is processed through rake-type classifiers.

The aggregate plant has the built-in flexibility to produce consistent quality material. It is electrically operated with push-button controls.



STEEL TRETTLES are imbedded in dam as concrete is built up. To cableways to do the same job. Crawler cranes and stiffleg derricks pour top of dam. Trestle No. 2 will be extended. It would take six will handle concrete placing in outlying areas.

Aggregate Cooling

Specifications require that mass concrete in the dam be placed at a maximum temperature of 65 deg. However, about 500,000 yd of concrete for foundations and the spillway apron has to be placed at a temperature of about 55 deg.

Cooling is accomplished by immersing aggregates in refrigerated water. A shuttle belt carries finished aggregate into eight tanks, each with a capacity of 120 cu yd. For about 35 min, aggregates are cooled by the chilled water to a temperature of about 42 deg. At the end of the cycle, aggregates are carried out on a 42-in. conveyor and sent to the concrete plant.

Operating the cooling tanks is an 1,800-ton refrigeration plant consisting of three ammonia compressors and four 48-in. dia coolers. Two 30-in. dia coolers 18 ft long supply chilled mixing water to the concrete plant.

Nearly 1,000 tons of cement a day are needed for peak production. Made at a mill about 120 mi away, cement is hauled in bottom-dump railroad cars of 20-ton capacity. At the unloading area, cement is dumped into a hopper and then pumped by Fuller-Kinyon units at the rate of 100 tph to any one of seven 840-ton storage silos.

From here, it is pumped directly to the concrete plant.

Turning out concrete at the rate of 320 yd per hr is a Johnson automatic batch plant. Its four 4-yd mixers dump into 4-yd buckets set on transfer cars pulled by 80-hp diesel-electric locomotives. Cars carry four buckets and have space for one empty.

Trestles

Concrete placing is handled by trestles mounting double-cantilever and revolving cranes. Cableways were considered, but six of

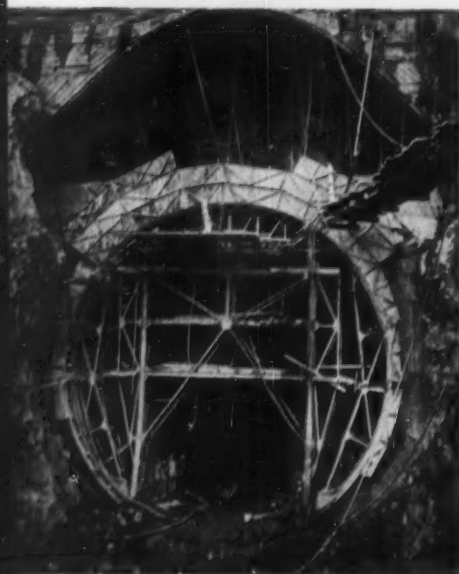
them would have been required to maintain a placing rate of 5,000 yd a day.

A two-stage system of concrete placing from four main trestles is followed. Areas out of reach of this main system will be covered by stiffleg derricks and cranes.

In the first stage, three trestles are set up parallel to, and one trestle perpendicular to, the dam axis. Trestle No. 1 is 400 ft long, parallel to the axis and 110 ft upstream of it.

Trestle No. 2 is 810 ft long, also parallel to the axis, and 135 ft downstream. In the first stage it will support cranes at El 1360 (top of dam is El 1645) for placing concrete in the main dam. Later, in the second stage, the trestle will be increased in height to El 1580. It then will be considered trestle No. 5 and will complete the placing of the top of the dam.

Continued on next page



STEEL FORMS mounted on huge jumbo shape walls of 50-ft dia diversion tunnel.

Also parallel to the dam axis is trestle No. 3, 600 ft long and 465 ft downstream. It supports both double-cantilever and revolving cranes and serves the main dam and left powerhouse. Trestle No. 4 runs along the centerline of the spillway normal to the dam axis. It is nearly 500 ft long and supports double-cantilever cranes which cover the spillway apron.

Supported on towers as high as 320 ft, trestles carry two standard-gage tracks for concrete cars. Tracks are flanked by crane rails 44 ft apart. Double-cantilever cranes mounted on 70-ft high gantries have 320-ft reaches. Revolving cranes on 60-ft gantries swing 4-yd bucket of concrete at a radius of 160-ft.

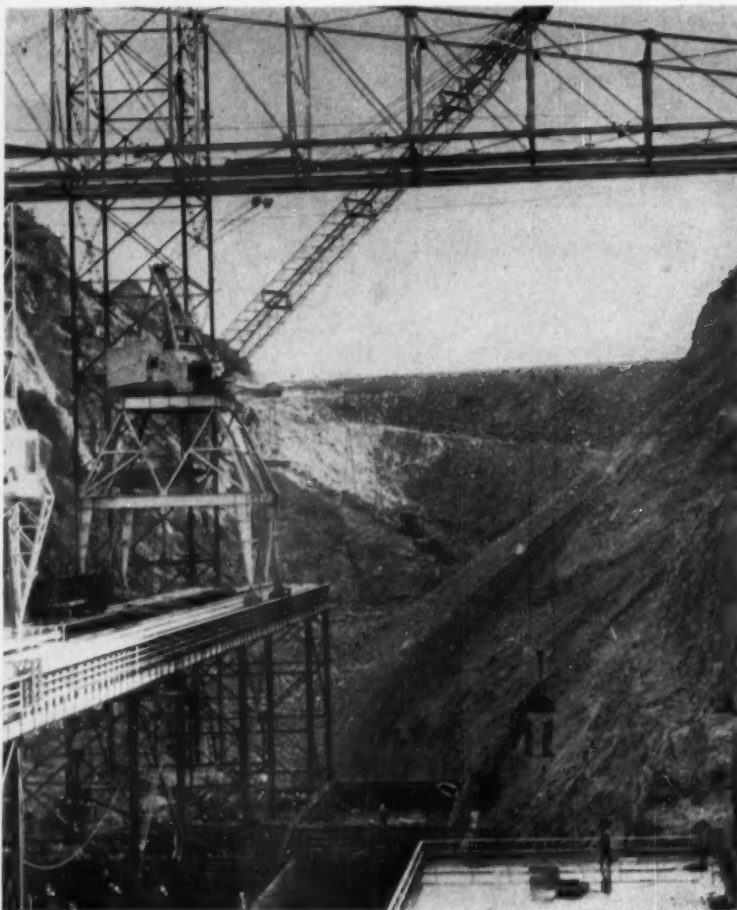
Concrete is built up in 6-ft lifts against Blaw-Knox cantilever forms. A minimum of 72 hr is allowed before the top of a lift can be covered with fresh concrete. Forms are moved up by ratchet-type chain hoists on A-frames. Mass concrete is cooled by 1-in. pipes embedded in the structure.

Personnel

Project manager is Harvey Slocum, who operates through S. D. Khungar, general manager and secretary to the government of Punjab. Designs and specifications were prepared by C. L. Handa. All major designs were checked by U.S. Bureau of Reclamation.



DOUBLE-CANTILEVER American crane with 320-ft span rides on trestle No. 4, which runs normal to dam axis over spillway. In background, trestle No. 3 is erected high in air.



4-YD BUCKET is lowered by gantry-mounted American crane operating at maximum radius of 150 ft. Concrete is built up in 6-ft lifts behind Blaw-Knox cantilever forms.



Where was the fault—in design, materials, or construction?

Experts Probe Building Failure



INVESTIGATING the collapse is a committee of experts headed by Dr. George Granger Brown of the University of Michigan and including Kalamazoo contractor Cameron Davis.

INVESTIGATORS are trying to determine why part of a four-story reinforced concrete office building under construction in Jackson, Mich., collapsed suddenly last month, killing 10 workmen. A 72x144-ft section of the building dropped into the basement a few minutes after concrete had been placed for the fourth floor.

The 10-in. floor slabs were supported on 25 to 20-in. columns on 24-ft centers. Specifications required that slab concrete reach 3,000-psi strength at 28 days. First and second floors had cured for several weeks, and shoring had been removed. Third-floor concrete was 20 days old, and had been reshored.

Examination of columns after the collapse suggested that the punching shear of slabs at the columns might have caused the failure. Slabs were cast integral with the columns, but there were openings for ducts and piping along two sides of some interior columns.

Michigan State Police said they found no evidence of criminal negligence. A committee of experts appointed by Michigan's governor has not yet reported. General contractor is Herlihy-Mid-Continent Co., Chicago; architect is Black & Black, Lansing; structural engineer is Ray W. Covey, Detroit.



Quarrying Stone...



Producing Aggregates...

Stuck for Materials . . .



WORKMAN loads blast hole with explosive cartridge while second man stands by to tamp charge with rod. Blast holes are 16 ft.

CONTRACTORS OFTEN have to resort to odd ways of getting the job done. But you rarely hear of one turning to a tombstone maker for materials.

Yet, that's what Alexander Construction Co. of Minneapolis had to do in order to get aggregates for 13½-mi paving spread on the Massachusetts Turnpike outside of Blandford, a tiny, one-traffic-light town high in the Berkshire hills.

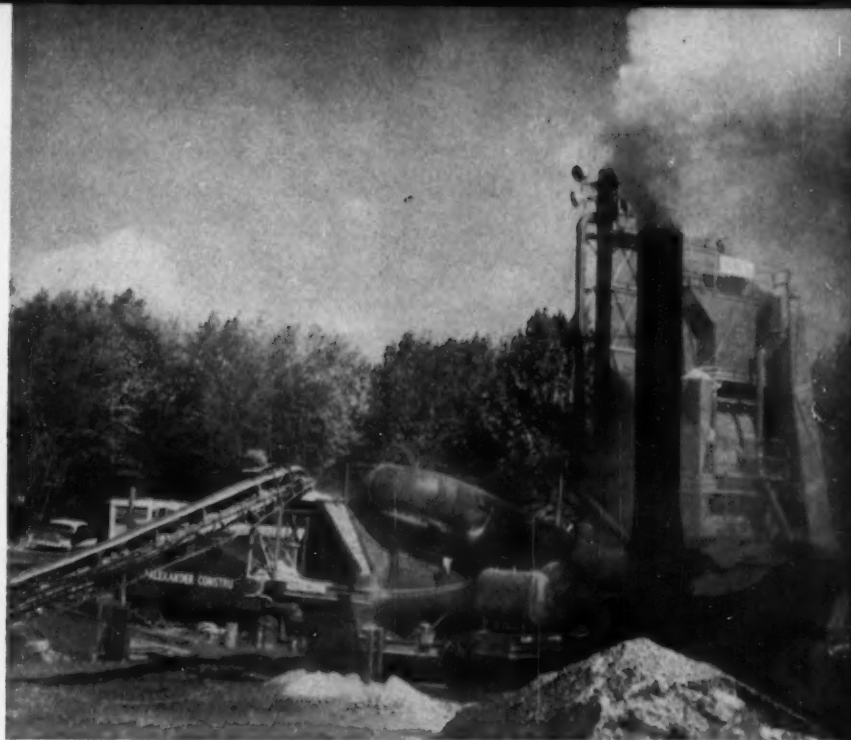
Alexander is paving subcontractor to S. J. Groves & Sons Co., also of Minneapolis, holder of two

contracts totaling \$9.3 million to push through a section of the 123-mi Turnpike that runs from the New York State border to near Boston.

When Alexander was awarded the contract by Groves, the firm first figured to buy both aggregates and bituminous concrete from a local supplier. The job requires some 168,000 tons of aggregates and 105,000 tons of bituminous concrete. But the only supplier in the area could meet but a part of the contractor's needs.



EXPLOSIVES for blasting operations are stored in these Dravo containers. Containers—fitted with skids—normally are used as packing cases for ocean transport. Containers keep charges and fixtures safely locked and protected. They also are easy to move.



Batching Asphalt Mix...

Contractor Produces His Own

Alexander had no choice but to go into the aggregate producing business. Buying and setting up both rock and crushing and asphalt plants would be expensive—but not too much of a problem. With the nation's multi-billion dollar highway program about to get under way, Alexander figured increased construction volume for itself would more than offset the cost of the plants.

But producing aggregates and batching bituminous concrete is one thing. It's another to find an adequate source of rock supply for aggregate production.

Groves' contract included the removal of some 2,000,000 yd of stone. But this was shale and other material unsuitable for aggregates. That's when the tombstone maker came to the rescue.

Contractor scouts discovered a small tombstone maker, Chester Granite Co. of Blandford, operating a small quarry not far from the work site. Chester blasts out several tons of rock monthly to get a small quantity of high-grade rock for tombstones and other decorative stone work.

"It was a sight to see," said R. G. (Bud) Gray, Alexander's project manager. "There we were, looking for a stone supply, and a few feet from the job was a stockpile of stone that, if imperfect for tombstones, was perfect for aggregates. It needed only crushing."

Gray's joy, however, was short-lived. Though tests proved the stone on the stockpile ideal for aggregate production, it was mixed heavily with overburden that had been stripped from the quarry and stockpiled with the stone.

"It would have cost us a fortune to separate it before we had enough clean rock for crushing," Gray said.

So Alexander also had to go into the quarrying business. Chester agreed to let the quarry be worked for aggregates in return for a royalty for every ton removed.

John Varner, an Alexander superintendent, was put in charge of the quarrying and stone-crushing operation. This phase amounts to stripping the rock bed of overburden, blasting sections of stone from the quarry face, and delivering rock to the crushing plant.

Varner drills 400 vertical holes 16 ft deep in a 5x6½ ft pattern. He drills with seven Gardner-Denver wagon drills fitted with 8- and 16-ft steels and 2¾-in. Timkin bits. Two Ingersoll-Rand 600 cfm air compressors supply power.

Each shot is designed to pull 6,000 tons of rock. Varner loads each hole with 15 lb of Atlas and DuPont powder, a 1-lb-per-ton pull ratio. Powder for the first third of the hole has 75% gelatin, and the remaining two thirds has 40% gelatin. Placing a heavier load at the bottom produces greater fracturing. Atlas Rockmaster blasting caps set at 0 to 8 millisecond delays detonate the blast. Varner averages two shots weekly.

Two Northwest 80-D shovels load fractured rock into rear dump Euclid trucks that carry the rock up a quarry ramp to the contractor's crushing plant.

Producing Aggregates

Alexander's huge Pioneer Model 174 crushing plant is portable. Its crushing units, conveyor belts, and hoppers can be dismantled, trans-

STUCK FOR MATERIALS ... Continued



APRON FEED at bottom of surge pile places 6-in. stone on conveyor that carries stone up through corrugated steel pipe to secondary crushers. Stone then is broken into five sizes.



NETWORK OF CONVEYORS takes different sized aggregates that will be used for making bituminous concrete and feeds them into

batch plant dryer. Discharge gates set in aggregate stockpiles are controlled, along with conveyors, by batch-plant operator.

ported elsewhere, and reassembled. But the plant turns out better than 300 tons of various sized crushed stone per hr.

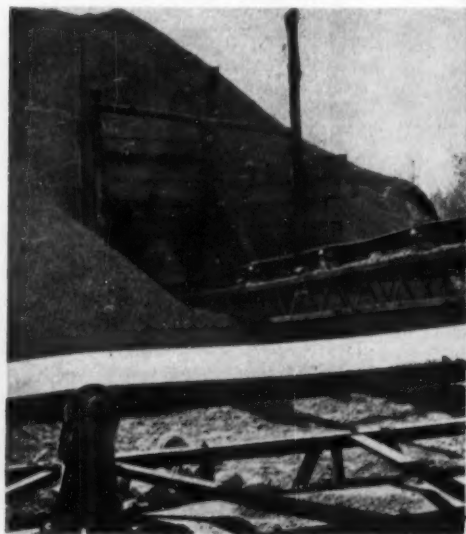
Stone is dumped from quarry trucks into a hopper and apron fed into the plant's primary unit, a 4248 overhead eccentric jaw crusher. A 95-ft conveyor belt, 36 in. wide, carries stone from the jaw crusher and dumps it on to a surge pile set over a 42-in. plate feeder. The surge pile permits the jaw crusher to work continuously and create a stockpile. Rock is taken from this for secondary crushing to meet varying daily needs.

As needed, stone is carried up a 135-ft belt through an 8-ft corrugated steel pipe set in the surge pile and into a 5x17-ft Mesabi screen for size gradation.

Stone under 3½ in. automatically feeds on to a third conveyor, and sizes over 3½ in. chute into a 4½-ft diesel-powered Symons cone crusher. Stone from the cone crusher then is fed on to the conveyor carrying the under-3½-in. aggregates.

A 5x12-ft three-deck screen further grades stone from this third conveyor. The screen sends 2¼-in. stone by chute into one storage hopper and ¾-in. stone into another. Sand is screened into a third hopper.

Stone over 2¼ in. chutes to a second 4-ft Symons cone short head crusher. Aggregates produced by this crusher are conveyed back and dumped by transfer spout on to the 135-ft belt where they are returned



with new stone to the three-deck screen.

There, 2¼ and ¾-in. stone, and sand, are sent to three hoppers. Smaller sizes fall on to a 55-ft belt. These are carried to a second 5x12-ft three-deck screen that separates ¾ and ¾-in. sizes of stone. These fall with sand into three hoppers for removal to the asphalt plant.

Asphalt Mix

Two grades of bituminous concrete are used on the job. One is a coarse mix. The other is a fine, surface mix. Turning this material out at a 6,000-lb per batch clip is a new Barber-Greene 896 Batchomatic asphalt plant. The plant produces better than 220 tons of bituminous concrete per hr.

A system of conveyor belts feeds aggregates to the plant's dryer. In a semicircle behind the plant the contractor stocks two piles of sand and three grades of aggregates. An apron feeder in each pile loads a conveyor belt connected to the master conveyor that runs to the dryer. Thus, the plant operator can call up aggregates for coarse or fine mixes, as needed.

Once aggregates get inside the dryer, the plant operates on the same principle as Barber-Greene's 4,000-lb 894 plant. Aggregates are carried from the dryer up the plant's hot elevator where they drop on to a four-deck screen.

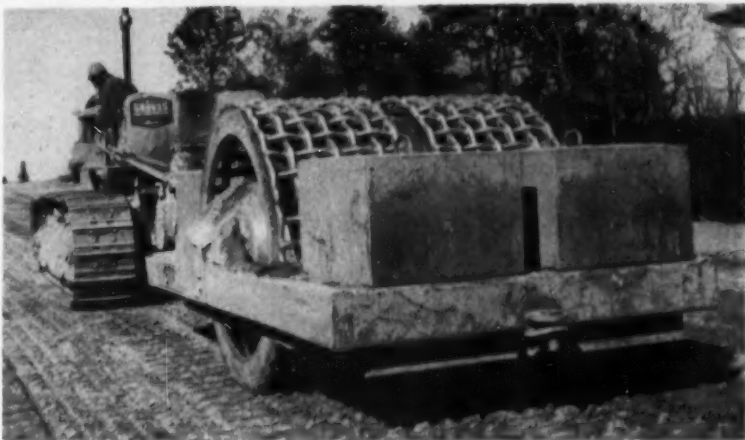
The screen grades the stone and drops proper sizes into one or more of four storage bins. To weigh a batch, the plant operator opens a strike-off gate set under each storage bin to drop aggregates into the weighing bin. After weighing, aggregates flow into the plant's pug mill to be mixed with asphalt and discharged into trucks for removal to the job.

Once Groves has rough graded the paving strip, Alexander places and compacts a 14-in. sand and gravel base. This is followed by a 6-in. course of crushed stone. The contractor compacts the stone first by roller, then by vibrating machine. A penetrating spray of liquid asphalt follows.

Paving

A 1½-in. binder course of bituminous first is placed by three Barber-Greene spreader-finishers working alongside each other. The binder course gets several passes with the rollers and the spread is ready for a 1½-in. surface course. This is placed in the same way as the binder course.

Variety of Compactors Help Prepare Subbase



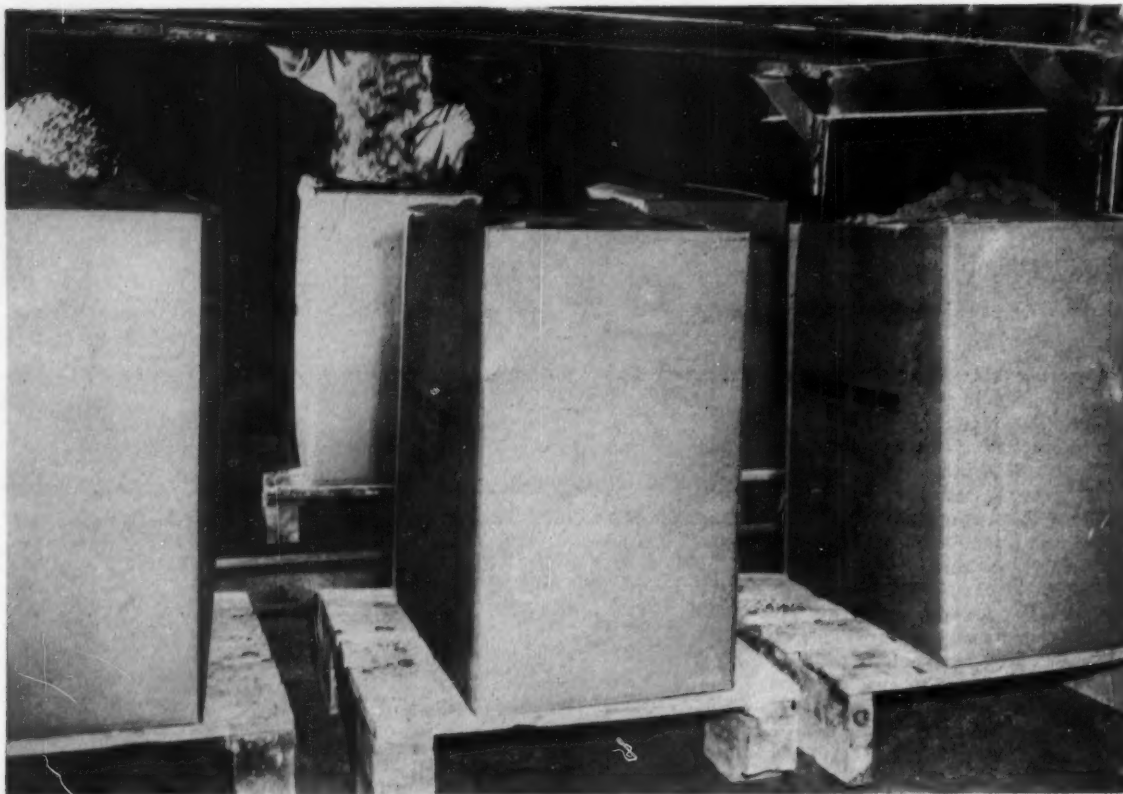
TO COMPACT SUBBASE, Alexander uses Hyster grid roller pulled by Cat D8 tractor. Grid-type roller is designed for embankment compaction and crushing pit-run rock surfaces.



VIBRATORY ROLLERS—relatively new in field—are used by contractor to compact granular subbase. These two working in tandem are tractor-pulled Essick vibratory rollers.



STONE-BASE COMPACTION is achieved with help of Jackson vibrators that follow first compaction by steel wheel rollers. Two courses of 1½-in. thick asphalt go on top of this.



SAND for a building modernization job in the busy Grand Central area of New York City is dumped into 28x20-in. corrugated boxes 30 in. deep from a hopper with four dump gates. Each box rests on a wood pallet, holds 1/3 yd of aggregate, weighs 900 lb.



BRICKS are loaded into the corrugated containers by hand. Each box holds 200 bricks.

Brick, Aggregates

DELIVERY of aggregates and brick in corrugated shipping containers saves time, trouble, and expense for contractors working on small jobs in crowded urban areas.

In fact, a New York City building supply firm claims it saves its contractor-customers as much as 60% of the labor costs of handling sand, cinders, gravel, and brick by shipping these materials in easy-to-handle packages.

Triboro Building Supply Co. of Long Island City, N.Y., points out that packaging these materials also eliminates the nuisance of obtaining a permit for sidewalk storage, reduces pilferage and losses from breakage of brick, and makes it easy to avoid littering the job with spilled materials.

Triboro's package is a 28x20-in. corrugated box 30 in. deep. It holds 1/3 yd of aggregate and weighs about 900 lb when filled. The brick boxes hold 200 bricks.

Triboro loads sand, gravel, or

cinders into the boxes by placing each box on a wood pallet and sliding it beneath a dump gate in a hopper. The hopper has four gates so that four boxes can be filled at once.

Fork lift trucks place the loaded containers on trucks for delivery to the job site. Triboro supplies the pallets on which the boxes are conveyed and lends manual lift trucks to the contractor to move the boxes on the job.

Cost Is Low

The cost of packaging aggregates in the corrugated containers is \$3 a yd. This covers the loan of the pallets and the manual fork trucks in addition to the cost of the package.

But Triboro says one laborer can move 5 yd of boxed aggregate to a job site in a building in 30 min. Hauling 5 yd of aggregate by wheelbarrow from the street to the job site might take three men half



FORK LIFT TRUCK picks up full container and places it on the delivery truck that will carry it to mid-Manhattan job site.



MANUAL LIFT TRUCK makes it easy to unload box from delivery truck in crowded area one block from Grand Central Terminal.

Come in Convenient Packages

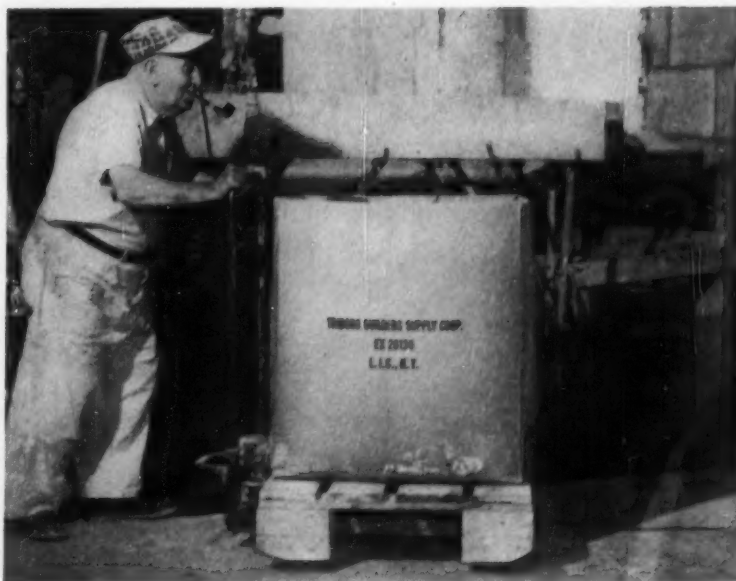
a day. So the \$15 additional cost of packaging the material is more than offset by savings in the labor costs of handling the materials.

For packaged brick the additional cost is 1¢ per brick, or \$2 on each box of 200 bricks. But a box of 200 bricks can be moved from the curb to the job site in about 10 min.

Time Savings

Loose brick usually is handled in wheelbarrows in loads of about 50 bricks. And it takes about 30 min. to load a barrow of bricks, wheel it to the job and unload it. To haul four 50-brick loads would require about 2 hr of labor, instead of the 10 min. it takes to move one box. And in addition, handling the brick in boxes reduces breakage to less than 0.5%.

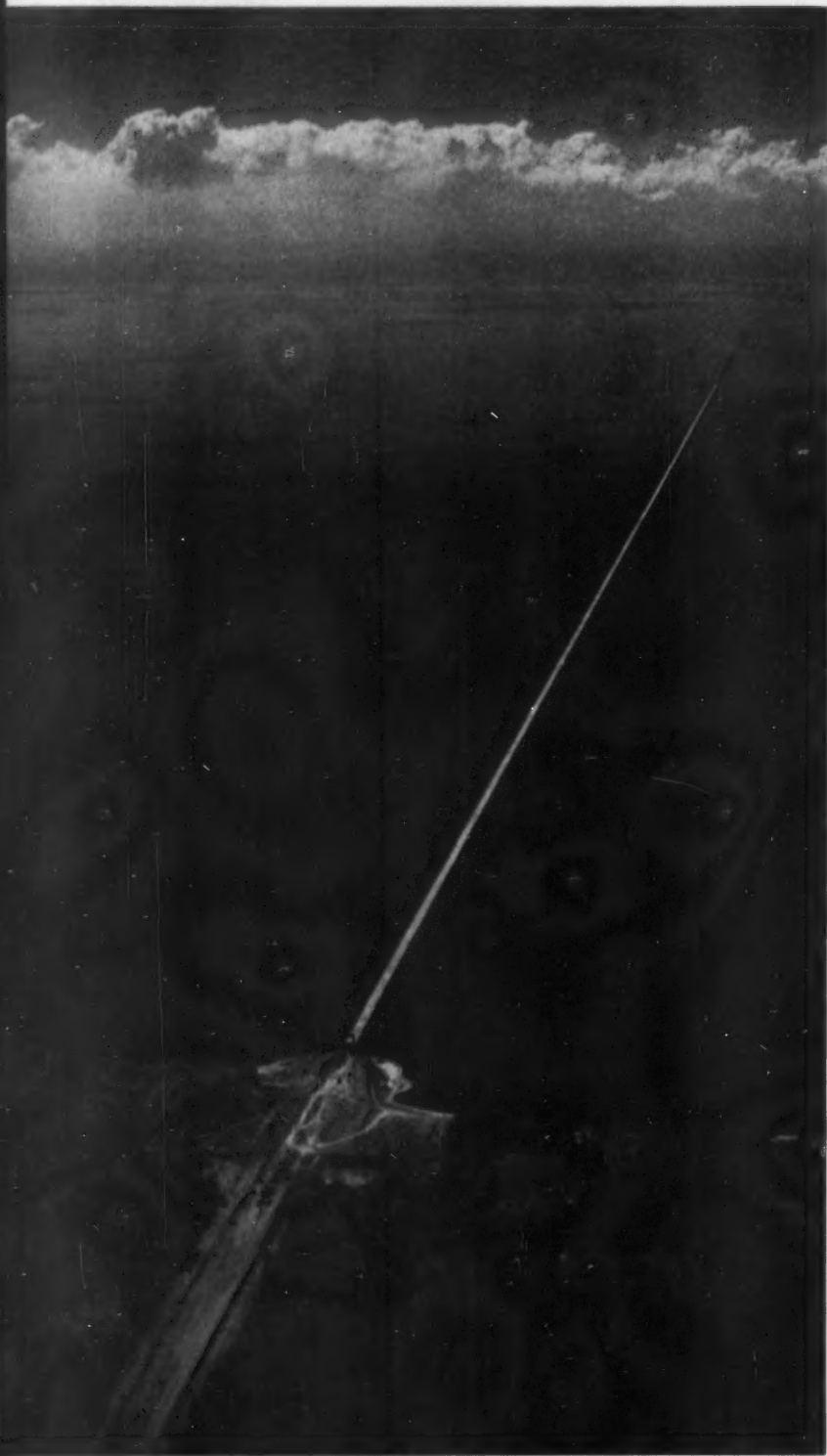
Triboro says its contractor-customers realize a savings on the labor cost of handling 6,000 brick of more than \$100 and reduce breakage expense by another \$25.



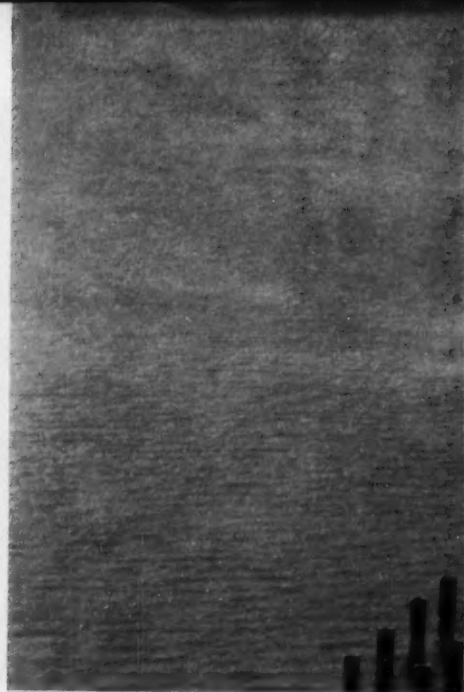
LABORER for Thatcher Construction Co., Inc., of New York takes over at the sidewalk and easily rolls the container to the eighth floor work area within the building.

EDITOR'S NOTE

This is the second of two articles describing construction of the Lake Pontchartrain Causeway.



WHITE STREAK piercing Louisiana's Lake Pontchartrain marks beginning of 24-mi precast, prestressed concrete causeway. Erected in only 15 months, it is world's longest.



PAIR of piling rigs push toward south shore of lake. Two piles are handled simul-

Unique Fleet

NEW CONSTRUCTION speed records are chalked up almost daily—but it will be a long time before anyone beats the erection pace set on Louisiana's Lake Pontchartrain Causeway.

In only 15 months, Louisiana Bridge Company's fleet of unique floating rigs pieced together 24 mi of precast concrete components. They averaged better than 1½ mi per month and worked only one 10-hr shift a day to do it. Their daily pace of 20 piles, and 8 caps and slabs completed the job four months ahead of schedule.

It was a whirlwind operation. And it had to be. The contractor knew how turbulent the shallow lake can get in a storm and what it could do to floating equipment. In fact, all through the job, the contractor maintained a radar weather-scanning station to detect storms as early as possible. Several times the station was able to warn crews in time. And it sometimes helped spot lost boats.

But the only real way to beat the weather was to push erection at top speed. To do that, the contractor depended on a 200-ton floating derrick, four 50-ton derrick boats, 36 barges, 7 tugs, and a fleet of launches.



taneously. High-pressure jets suspended from tower loosen underlying material as hammers drive 88-ft cylinder piles.



SPREAD of driving equipment consists of one jetting barge, two Wiley 50-ton derrick boats, and two pile supply barges.

Erects Causeway at Record Pace

Erection was broken into three primary operations—pile driving, cap setting, and slab placing. When these crews were finished, there was very little left to do. Except for finger-type expansion plates at every fifth slab and aluminum handrail, the bridge was complete.

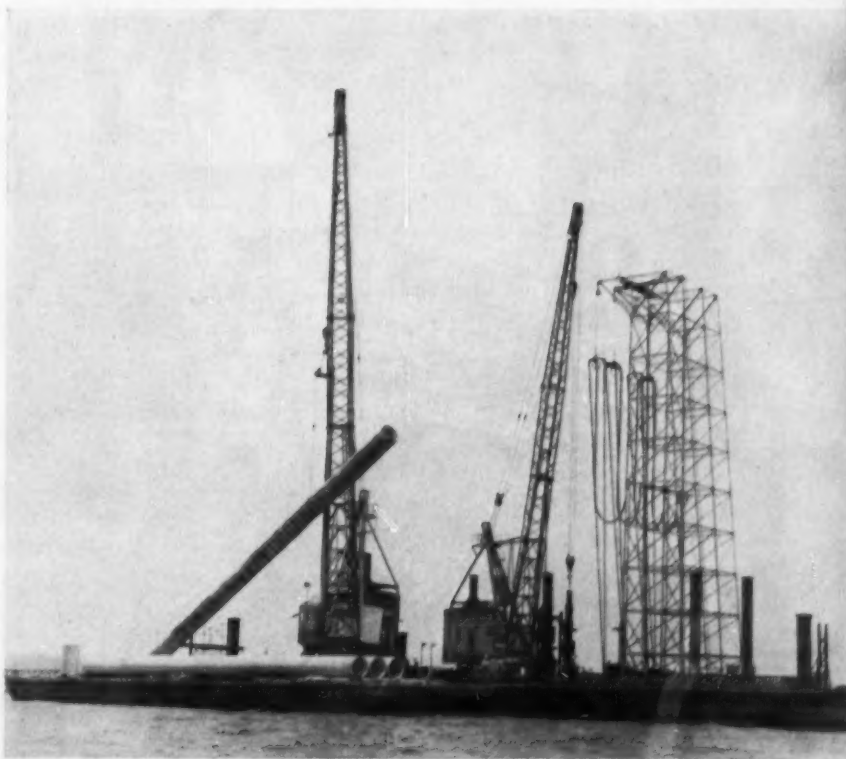
Pile Driving

In only 13 months, the contractor drove 4,886 cylinder piles 54 in. in dia and an average of 88 ft long. The lake varied from 15 to 20 ft deep.

Because speed and accuracy were the prime considerations, piles were driven and jetted two at a time through a positioning templet. Two 50-ton derrick boats flanking the templet drove piles while a tower-mounting barge in front handled jetting.

Here's how a typical two-pile bent was driven. When one pair of piles was driven, pile hammers were removed from the pile tops and returned to the derrick boats. The templet then was hoisted by one derrick and moved forward.

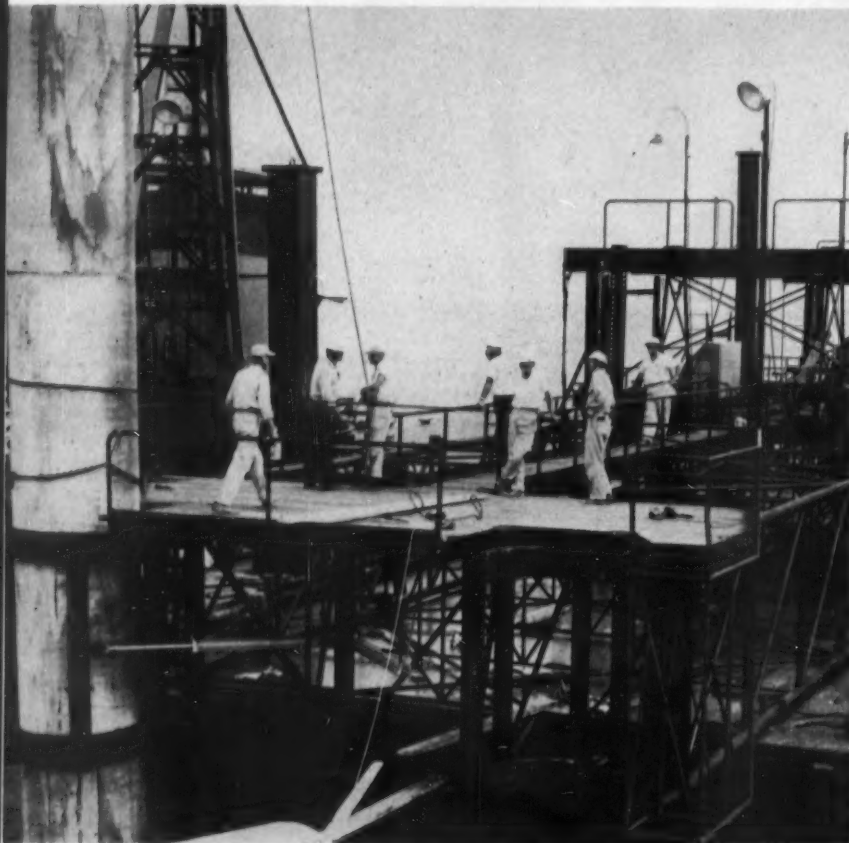
Made mostly of pipe-truss sections, the templet was designed to anchor itself to the two previously-driven bents and cantilever forward. It was lowered carefully



DERRICK upends pile with single-point pick-up. During upending, pile's base is protected by sand box. Other crane lifts huge hammer from stand to drive adjacent pile.



JETTING BARGE mounting high tower is moved forward to permit pile-driving templet to be advanced. Hammers are set upright in special stands for quick handling.



TEMPLET'S front sockets position piles for driving. Ordinarily templet is mounted on previously driven piles and cantilevers forward. Here, at start of job it rests on barge.

so that the four driven piles would fit into appropriate sockets. At the front end, two sockets were open to receive piles.

Adjustable head frames then were fitted over the pile tops to secure the templet. Each head frame was adjusted individually because of the variations in the elevations of the pile tops.

Now the two front sockets were ready to be positioned. This was done by jockeying the entire templet. Hydraulically operated clamps, controlled by a console, were mounted in each of the four rear sockets. By adjusting the grasp of the clamps against the piles, the cantilevered front could be positioned with very close tolerance. Surveyors gave signals from a movable catwalk attached to piles several hundred feet behind the spread.

When the adjusting was completed, each crane picked up a pile from the barges. With a simple choker sling tied at about the third point, a crane could easily upend a pile. A sand box under the base end prevented damage.

Hanging plumb, piles were swung into the front sockets on the templet. Gates were close hydraulically, and the piles were allowed to sink into the soft lake bottom.

Piles then were ready to be forced to refusal by jetting, driving, or a combination of both, depending on the type of material encountered. Generally, piles were jetted first and then driven.

Jetting

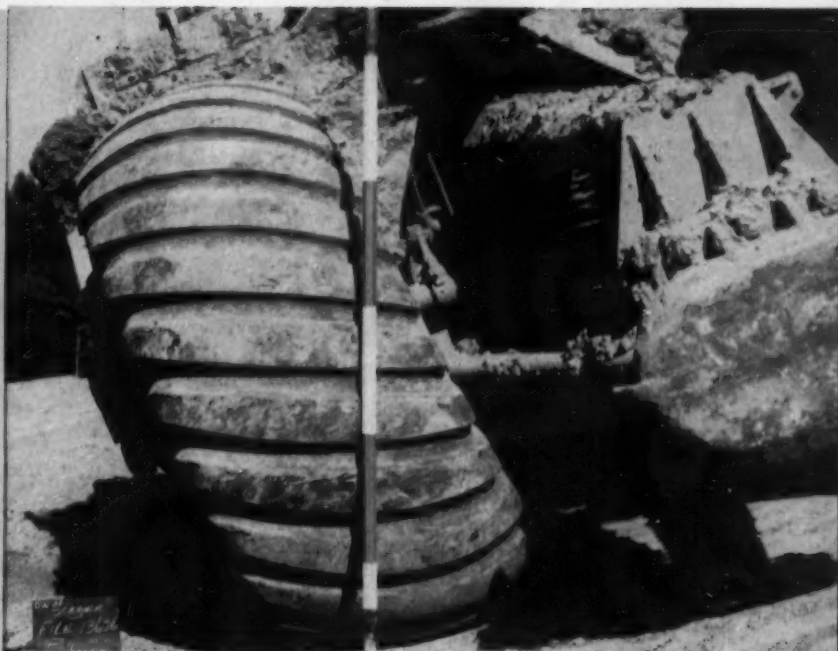
Jet pipes 4 in. in dia hung in two groups of four from the high steel tower mounted on the rear of the forward barge. Operated by small hoists, jet pipes were lowered through holes in the forward sockets which made them surround each pile as it went down. Three Griffin jet pumps supplied high-pressure water.

Pile hammers were Raymond 0000 single-acting types striking 52 blows a min and developing 48,750 ft-lb. Their 15,000-lb rams dropped 3 1/4 ft. Pile tops were protected with oak-pad cushioning rings 6 in. thick. When driving was completed, hammers were returned to the derrick boats where they were placed upright in special stands for easy handling. The operation then was repeated on the next pair of piles.

Continued on page 71

Caterpillar "torture tests" prove advantages of earthmover tubeless tires

Developed through the close co-operation of Caterpillar with leading tire manufacturers, these heavy-duty tires are now standard on all models of Caterpillar wheel-type Tractors, Scrapers and Motor Graders.



Punishing tests of heavy loads and high speeds at the Caterpillar Proving Grounds on Cat DW21 Tractors and Scrapers prove that new tubeless tires set new endurance records for earthmoving—pay off in longer life and less down time. Large photo at top shows test of bead air sealing ability with heavy, sidehill loads.

The search for a better way never stops at Caterpillar. The result—a constant flow of improvements in earthmoving equipment that pays off in increased production and lower costs on your job.

These new tubeless tires are an example of Caterpillar's policy of leadership in action.

From the start, Caterpillar spearheaded the design of these tires. Exhaustive "torture tests," made at the Caterpillar proving grounds on CAT® DW21 Scrapers, proved that they were miles ahead of tires then in use.

Under heavy loads and at high speeds, tubeless tires outlived tube type by 63%.

Now in use in the field for almost a year, tubeless tires are delivering the superior performance indicated by the tests. They eliminate an estimated 80% of down time caused by tubed tires. They are quicker and easier to mount. And they also give better puncture and blow-out protection.

Tubeless tires are now standard on Caterpillar wheel-type Tractors (drive wheels), Scrapers and Motor Graders. As a result, you can count on even greater production at lower cost with less down time from these heavy-duty machines. For complete information, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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**MODERN
HEAVY-DUTY
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GG WIDE BASE



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to help you beat the clock on the job!

TOUGHEST TIRES EVER BUILT

Today's fast schedules make breakdowns costly. That's why it pays to have the world's toughest tires on your rolling equipment.

Firestone has developed the strongest nylon tire ever made. The nylon cords are conditioned by Firestone's exclusive *Gum-Dipped Safety-Tensioned* process which controls tire stretch and tread-cracking. Firestone nylon plies resist impact breaks in the hardest going. They give you extra protection against flex breaks, heat failure and deterioration from moisture.

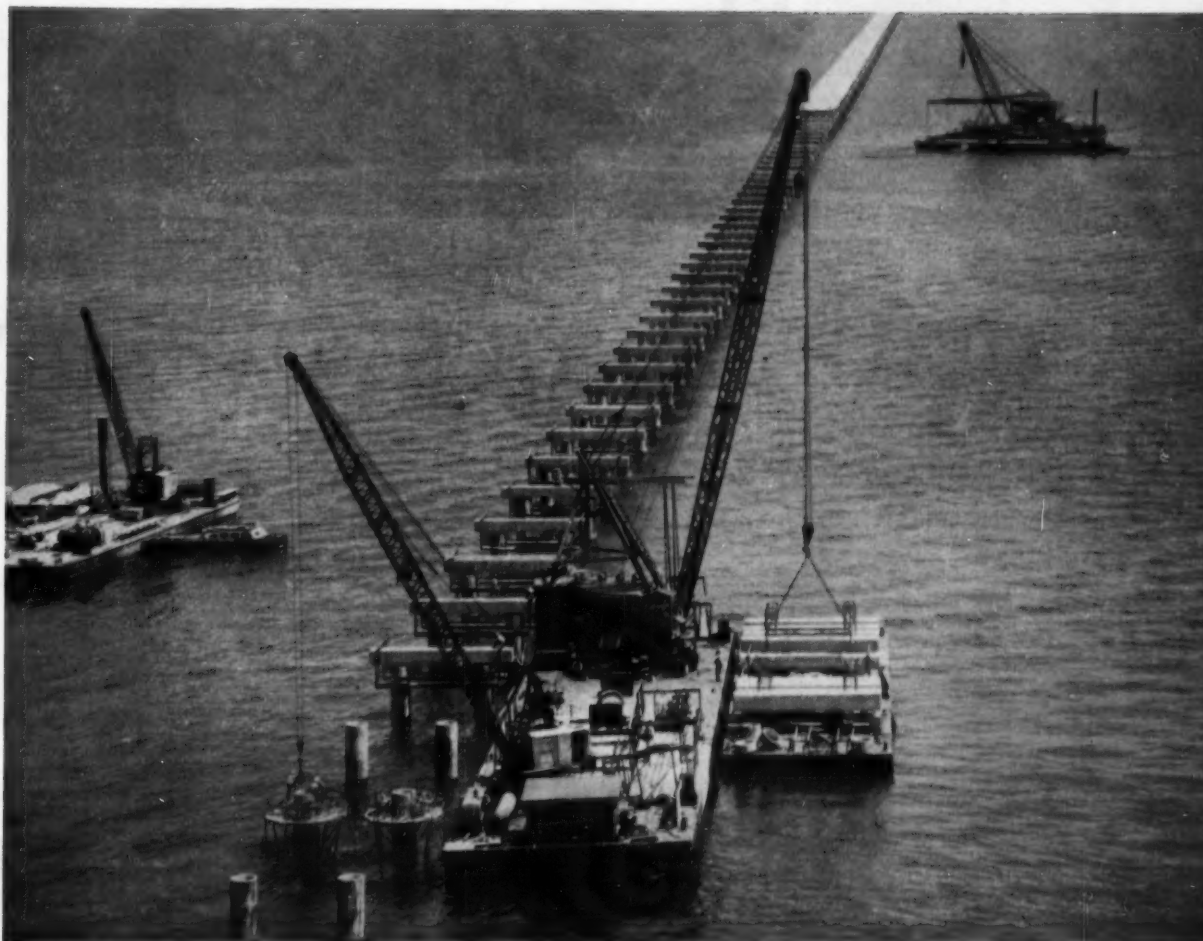
Firestone nylon tires beat breakdown losses on the job. And nylon-armored long life adds up to the lowest cost per-hour operation of any truck or construction tire. That's why it pays to use Firestone—and the cost records prove it!

**SPECIFY GUM-DIPPED
SAFETY-TENSIONED
NYLON TIRES BY...**

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COMPLETE SPREAD of floating equipment working behind pile cutting scaffolds as whirler sets caps. Concrete plant, left, prepares mix for pouring joint at pile top. Slab derrick is in distance.

PONTCHARTRAIN BRIDGE . . . continued from page 68

Setting Precast Caps Is Precision Job

Working several thousand feet behind the pile driver was a crew that cut pile tops and placed caps. They had a precision job to do. Caps were precast with anchor bolts and bearing plates—and they had to be placed accurately to receive the 200-ton slabs.

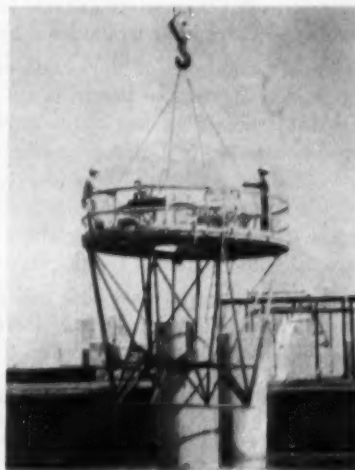
Basically, the spread consisted of a derrick boat, two pile-cutting scaffolds, supply barges, and a small concrete plant. First in line were two circular frames that fitted over the pile tops. They mounted Chicago-Pneumatic jack hammers modified to ride a circular track. Two hammers in each frame worked around the outside of the pile until its 4-in. concrete wall was severed. Wires and rods were burned, pile cutoffs were removed by a crawler crane, and the scaf-

fold was moved to the next pile.

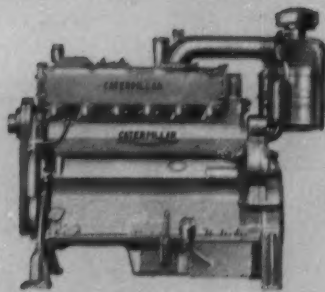
Cap setting followed closely behind pile cutting. With a rolling hitch, a 50-ton Wiley whirler could rotate a cap from its upside down position on the supply barge. When it was right side up, the cap was set down on a temporary support and fitted with two special frames. One frame hung from the ends and served as a scaffold. The other frame was fitted underneath the cap and served two purposes. It acted as a lifting frame when the cap was swung over the piles. And after the cap was lowered on to the piles, it handled the two jacks that positioned the cap.

To speed positioning, jacks were placed in the frame before the cap was swung. They rested on two

Continued on page 74



CIRCULAR SCAFFOLD is lifted from pile after air hammers cut pile top to grade.



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—the "Hi-Electro" hardened cylinder liner



A CATERPILLAR FIRST

—the chemically conditioned cylinder liner

A CATERPILLAR FIRST

—the stainless-steel piston protector



A CATERPILLAR FIRST

—the steel-backed aluminum bearing



A quarter of a century ago, Caterpillar created mobile diesel power. For the first time, the power of the diesel engine was unleashed from its bulky foundations and put to work in the field—compact, economical. Here was diesel power of simple design, with no need for experts to operate and maintain. Here was diesel power with the lugging ability to knuckle down to the tough jobs.

The introduction of mobile diesel power was a tremendous advance in many fields. It provided efficient diesel power for tractors, motor graders, earthmoving equipment . . . for the work boat, the gin, the locomotive, the oil rig, the municipal plant . . . for *any* application in which steady, low-cost power is crucial. And everywhere, CAT* Diesel Engines proved themselves durable and dependable. They established Caterpillar as the leader in diesel engineering.

Today, hundreds of thousands of modern heavy-duty Cat Diesels are on the job in every corner of the world. And still the research continues. Study and experiment go ahead constantly in Caterpillar laboratories. Special testing machines help point the way toward new advances. Manufacturing techniques improve, too, in the world's largest diesel engine factory—where the quality of workmanship is the standard for the industry.

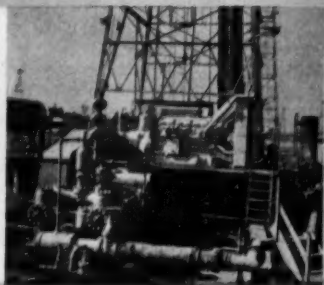
A modern world must have modern power—more and more of it. It is coming, in ever increasing quantity, from the production lines of Caterpillar, the leader.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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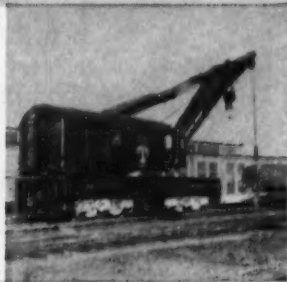
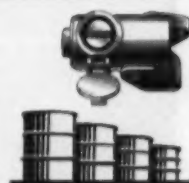


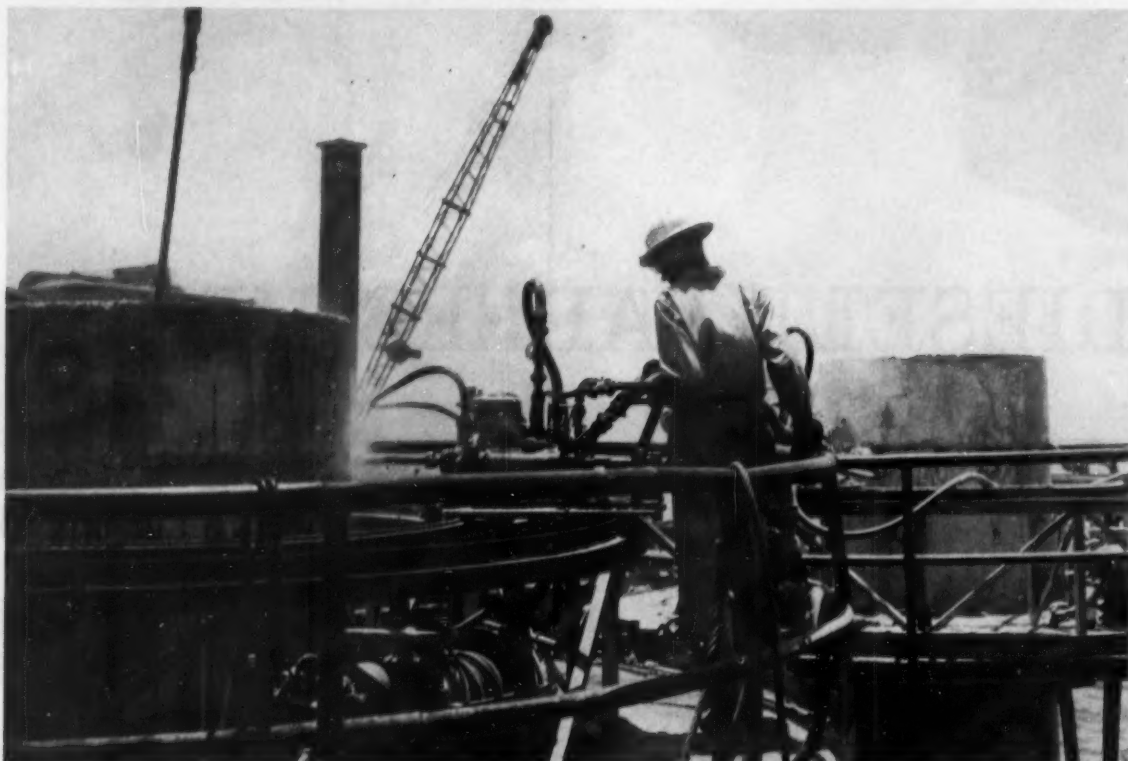
A CATERPILLAR FIRST

—the service meter

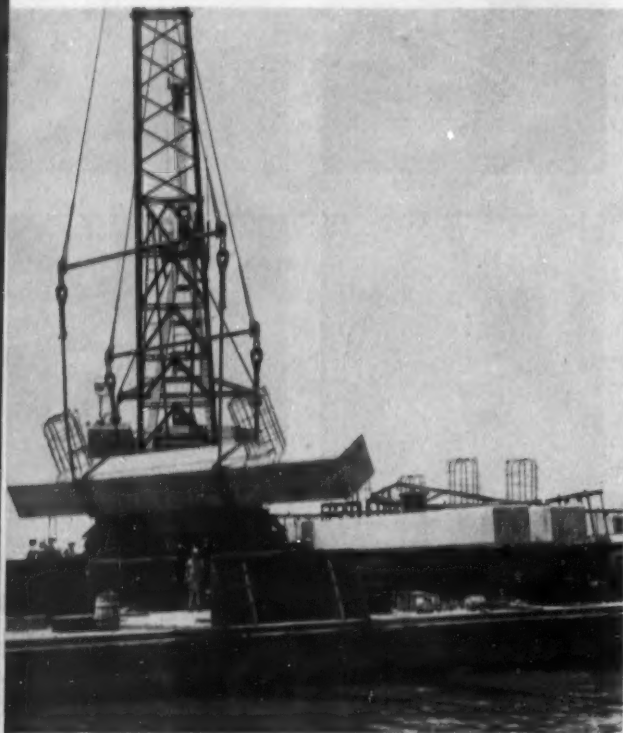
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—superior lubricants
(detergent oils)





PILE TOP is cut to grade by pair of Chicago-Pneumatic jack hammers mounted horizontally on carriage that rides circular tracks. After 4-in. thick concrete wall is severed, prestressing wires and reinforcing bars are burned and cutoff is removed. Continued on page 80



ROLLING HITCH turns caps right side up. To simplify forming, they were precast upside down with reinforcing cages upward.



PRECAST CAP is swung over piles. Lifting frame underneath mounts two positioning jacks. Outer frame serves as scaffold.

Why buy more
machine than
you need

?



There are many $\frac{3}{4}$ -yd. shovel-crane on the market. Some are "light weight"—at a price. Some are "heavy-duty," deluxe, more costly. The Lorain-25A is neither. It is a true, full-value, $\frac{3}{4}$ -yd. *general-purpose* machine that will surprise and satisfy you with its ability to handle a wide range of tough jobs. It is an all-around, fast, serviceable machine—not over-priced, not over-engineered, but containing many quality features that give you plenty of pep and power, plenty of long-life endurance.

If you want a real $\frac{3}{4}$ -yd. machine that will handle all of your day-to-day requirements with ease and still have enough "stuff" to handle your occasional "extra tough" jobs—the Lorain-25A is your machine. You don't have to pay the deluxe, heavy-duty price to get most of the big-machine features. You don't have to buy more machine than you really need to get the design and quality construction you know you must



have to get long life, profitable operation.

Feature for feature—value for value—dollar for dollar—you'll find the Lorain-25A gives you the most for your money in the general-purpose $\frac{3}{4}$ -yd. class. It is available as a $\frac{3}{4}$ -yd. shovel—as a hoe with 16' and 19' boom, with 30" or 40" dippers, or as a dragline, clamshell or crane. You owe it to yourself to check the "25A" in operation. Call your Thew-Lorain Distributor and ask him for a job-visit demonstration!

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THE $\frac{3}{4}$ -YD. LORAIN 25A

gets your job done
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EVERY DAY . . . these "25A" features make money

Here are important features that pay dividends the minute your operator takes over the control of a Lorain-25A. They mean easier operation, faster cycles, reduced operator fatigue, higher production. Ask your operator to check them, too.

- Big, 18" swing clutches—20% larger, fewer adjustments, longer life
- "E-Z" operating controls—effortless action, fast response
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- 2 crawler speeds in both directions
- 12' 6" crawler—stable, no "nosing-in"
- 4-way position tread and travel lock, hydraulically operated
- Independent travel available, a big advantage on dragline and hoe operations
- New, square-tubular-chord clamshell and dragline boom—lighter, stronger; greater lifting capacities; greater bucket operating ranges
- Steel shell lagging for bigger cable on drag-in drum
- Power load lowering is standard



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Consider these features in terms of a long-term investment—features that keep your Lorain on the job more hours over more years.

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- 19 anti-friction bearings on clutch shaft
- Hoist drums on anti-friction bearings
- Oil-enclosed cut gears on turntable
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- Sealed idler rollers on anti-friction bearings available for crawler
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- Fully convertible to shovel, crane, clamshell, dragline or hoe—extra job and profit possibilities
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THE 100 MILLION MILE ENGINE Designed, Engineered and Built by REO

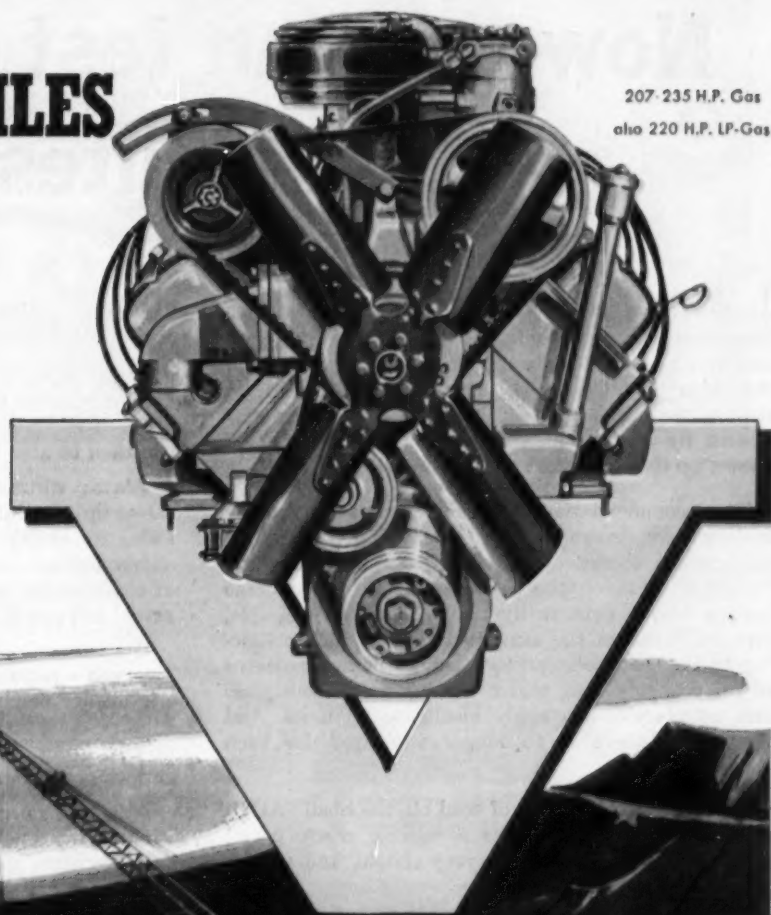
Million Mile V-8

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Tested by Truckers, and Backed by REO'S 100,000 MILE WARRANTY

(Advertisement)

In place of wasteful and uncertain crankcase-oil changing based upon mileage or hours in service, many operators of heavy-duty construction equipment now use a better guide that saves them both time and money.

Now you can test used oil in minutes

IT HAS COME as something of a surprise to some maintenance men to discover that they have been throwing away hundreds of gallons of still-good oil . . . year after year. Conversely, it is quite a jolt to realize that a costly engine-repair job could have been prevented by an on-the-spot analysis that would have shown up the condition . . . in minutes!

The recommendations for oil changes issued by engine makers have always been computed on "averages" for the various classes of vehicle service. And like the "average" man on the insurance chart, the average vehicle doesn't exist in the actual fleet. For example, two bulldozers of the same make and model, operating on the same job, can have quite different patterns of oil economy and engine condition. Obviously no one set of rules can apply ideally to all units. And fortunately there is no longer any need for such generalization.

From a couple of drops of used oil, the Shell "ADC* Oilprint Analysis" provides a reliable check of oil condition, in minutes. It is very simple, and with a

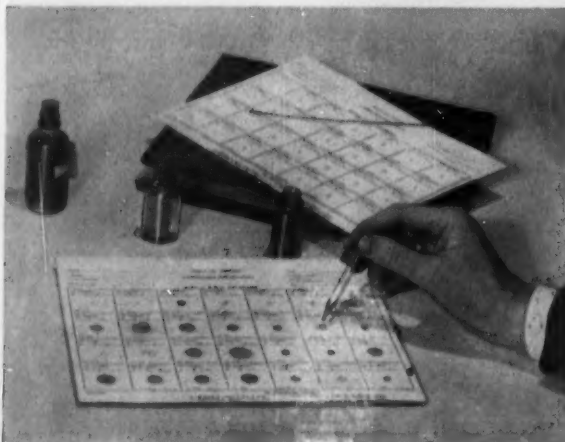
little practice, it tells you a lot about that oil and the engine that uses it.

What a drop of used oil shows: You place a drop of used oil on a piece of special filter paper supplied by Shell . . . let it stand a minute or two. You will then be able to see the following:

Water dilution: Even a tiny amount of water shows up . . . and that means not only that your oil is losing its ability to protect engine parts, but it also shows whether the water represents a normal amount of condensation or something more serious, such as an actual leakage of coolant from a faulty jacket.

Dispersancy/detergency: The same oil drop will give you a picture of how well the special additives in the oil are doing their job . . . whether or not the contaminants are being held in suspension where they do least harm . . . whether the cleansing and dispersing actions are adequate . . . whether the oil is still good.

Adulteration: The color of the oil spot will show whether too much contamination is occurring . . . and will very often point up the cause, indicating a check on



The simple test setup: sample bottles, a wire rod, a bottle of "indicator," and the permanent record card.



This single, on-the-spot sample reveals many things about an engine.



A fleet superintendent sees how easily the test is made.

injectors, nozzles, oil and air filters of diesels, or on plugs, carburetors and filters of gasoline engines.

All of the above can be learned from the single drop of oil . . . in an amazingly short time.

Alkalinity: Engine wear and engine deposits increase as the oil becomes acidic in nature due to contamination from combustion products. A special indicating fluid, developed in Shell Laboratories, tells at a glance whether oil is alkaline and still usable, or acid and how much.

Operators who keep an ADC Oilprint Analysis record of each vehicle generally find that the crankcase oil stands up longer than they had figured . . . a distinct saving in lubrication cost. At the same time, there is a running check on each engine that often detects impending trouble before its correction becomes costly. In this respect, the Shell ADC Oilprint Analysis qualifies definitely as one of the valuable recent tools of preventive maintenance.

If you are concerned with extending the service of crankcase oil, and with avoiding the risk of using oils loaded with contaminants, we suggest that you have one of the Shell service engineers demonstrate ADC Oilprint Analysis for you.

*Trademark



Photo shows an oil-spot test card...one phase in the visual life record of a charge of oil.

The Shell "indicator" shows acidity instantly. If spot turns red, oil is no longer fit to use, should be changed quickly.



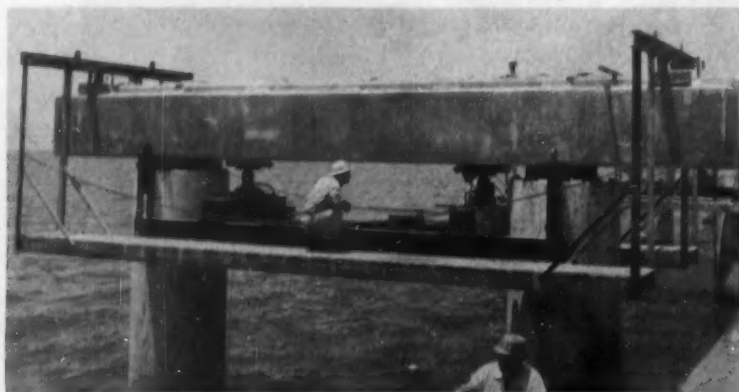
SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

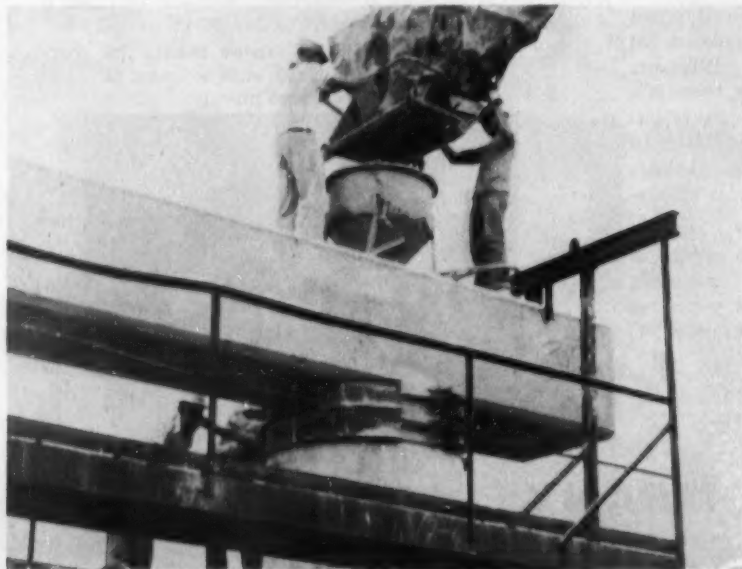




SURVEYORS set up instruments on pile cap, just positioned, and extend line and grade to next cap. Underneath, jacks are removed, frame is dismantled, placed back on barge, reassembled, and used again. Scaffold is left on for pouring concrete plug.



HYDRAULIC JACKS for adjusting grade of cap are set on frame that hangs from pile top. With screw devices they also adjust line and distance. Beams and shims fill gap.



CLAMP-TYPE FORM covers gap as concrete is poured through hole cast in cap. Bulkhead attached to bottom of reinforcing cage allows concrete to fill only top 4 ft of pile.

PONTCHARTRAIN BRIDGE . . . continued from page 74

long beams that hung from the lifting beams under the cap. When the cap was set down, the lifting beams separated the cap from the tops of the piles.

Cap Jacking

Now the cap was ready to be positioned for line, grade, and distance. Piles had been cut low so that the cap could be raised slightly for grade. This was done by two hydraulic jacks operated by hand pumps. Short beams and shims took up the gap and were grouted in later. Adjustments in line were made by screw devices mounted on top of the hydraulic jacks. The third adjustment, moving the cap back and forth along the axis of the bridge, was made by screw-jack units directly under the bases of the hydraulic jacks.

The cap was positioned quickly, and the entire jacking frame was removed and reassembled on another cap. Scaffolds were left in place for a follow-up crew that grouted the cap and piles together. It was a simple operation. Metal bands were tied around the gaps to serve as forms. Mixed in a small floating plant, concrete was funneled through vertical holes in caps and dropped into pile tops. A circular bulkhead tied to the bottom of the reinforcing cages allowed the concrete to fill up only the top 4 ft of the pile. This bonded the cap with the piles. The scaffold then was brought forward.

(Continued on page 82)

Bonus Quality
saves you money



FULL-FEEL CONTROL ANSWERS NEED OF NORTH CAROLINA CONTRACTOR

Extreme precision and flexibility were needed to perform a special job during construction of North-west High School in Charlotte, N.C. Four prestressed concrete roof girders 97 feet long and 4 feet 10 inches deep had to be lifted and set so precisely that wall ties could be placed in the beams.

For this exacting work, contractor F. D. MacDonald chose a Bucyrus-Erie 22-B Transit Crane equipped with a 40-ft. boom. This machine completed the job quickly and easily. Especially evident was its smooth operation . . . its ability to lift heavy loads and place them delicately.

Transit Cranes give you, as standard equipment, more of the features you need most—power controlled lowering of load line for delicate positioning of loads, friction swing brake for accurate spotting and holding of boom, independent power controlled lowering of boom suspension for changing boom lengths conveniently, open-throat boom design to permit rigging of multi-part lines, and extendible outriggers for added stability during swinging of capacity loads.

Two sizes available—the 15-ton Model 15-B and 25-ton Model 22-B. See your nearby Bucyrus-Erie distributor soon for full details.

215E56C



Bonus Quality

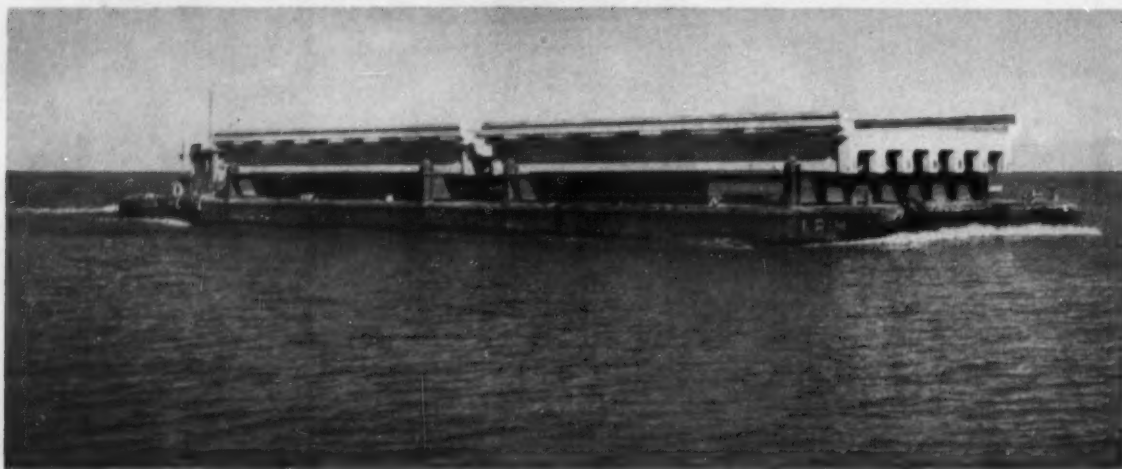
The steel, iron, and bronze castings used in Bucyrus-Erie machines and poured in the company's own foundries are laboratory controlled to the highest standards. Triple tests are run on every "heat"—such as the one being poured here—so that castings will possess the qualities which give long life and economical service on the job.

**BUCYRUS
ERIE**

South Milwaukee,
Wisconsin

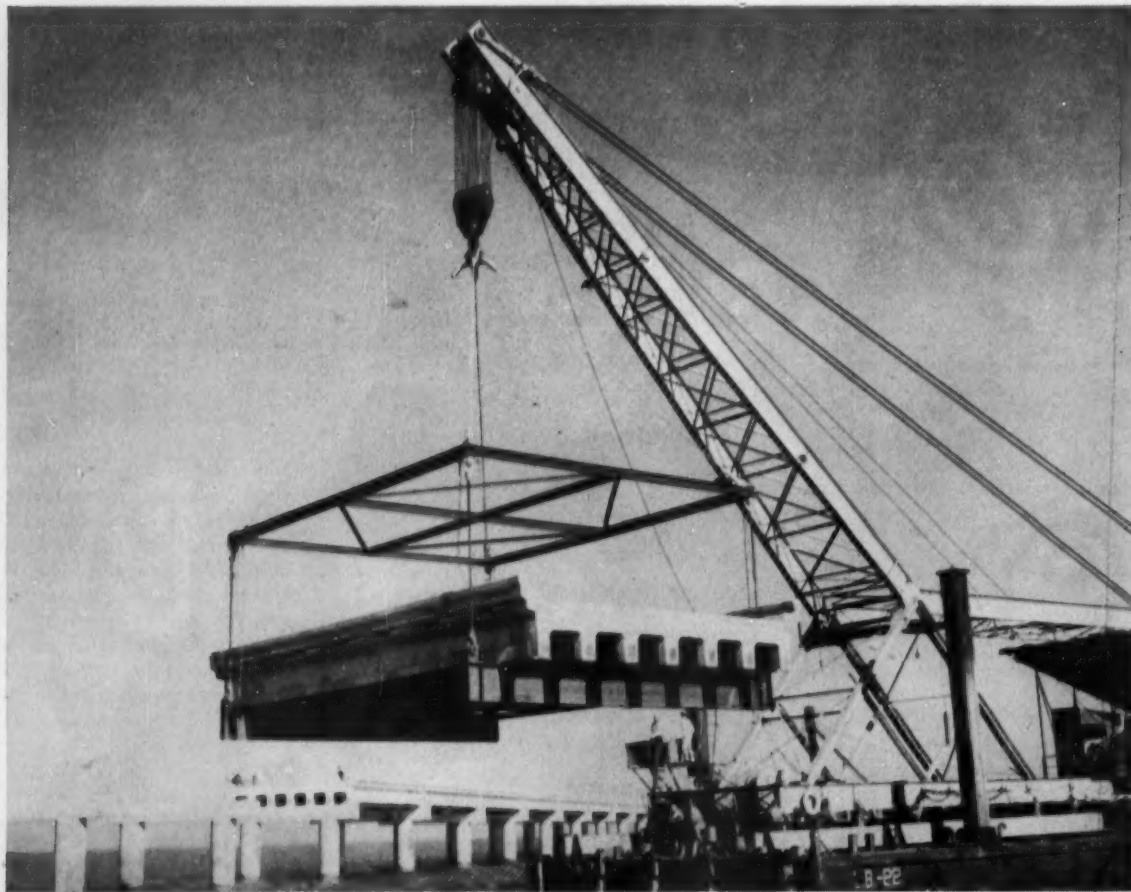
Attend the ROAD SHOW
CHICAGO, Jan. 28-Feb. 2, 1957

Fixed-Boom Derrick Places 200-Ton



BARGE CARRIES two precast and prestressed slabs across lake to point of placement. Derrick easily erected plant's daily pro-

duction of eight slabs. It was so efficient that it could have handled twice that number in the same 8-hr period.



DERRICK reeved with 22-part line lifts 200-ton slab and swings it toward bridge. Rig was designed to ride on bridge deck, but it

worked so well on a barge that it was left there. It operates strictly as hoisting mechanism. Boom and all other parts are fixed.

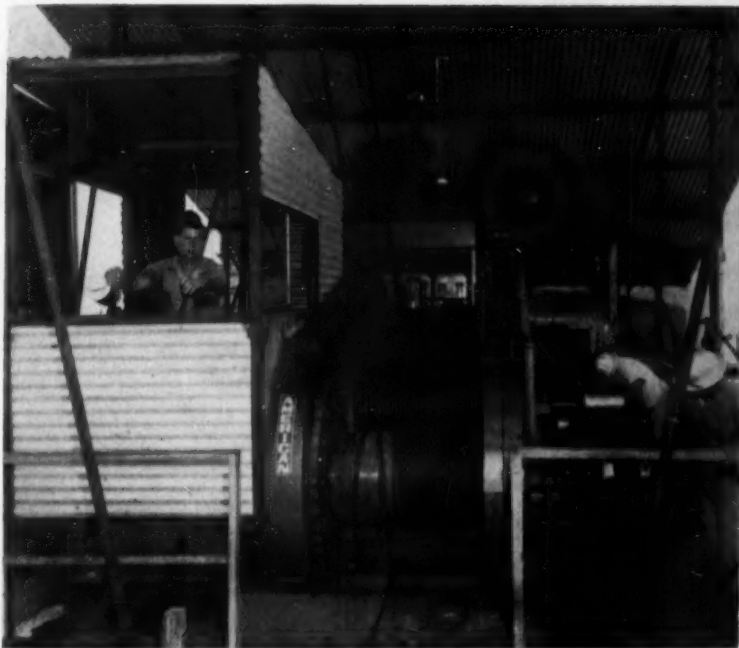
Deck Slabs

Final operation was setting 200-ton precast slabs. It was done entirely by a single derrick set on a barge. Originally designed to ride on the completed bridge deck, the rig worked so well from the barge that the contractor decided to leave it there.

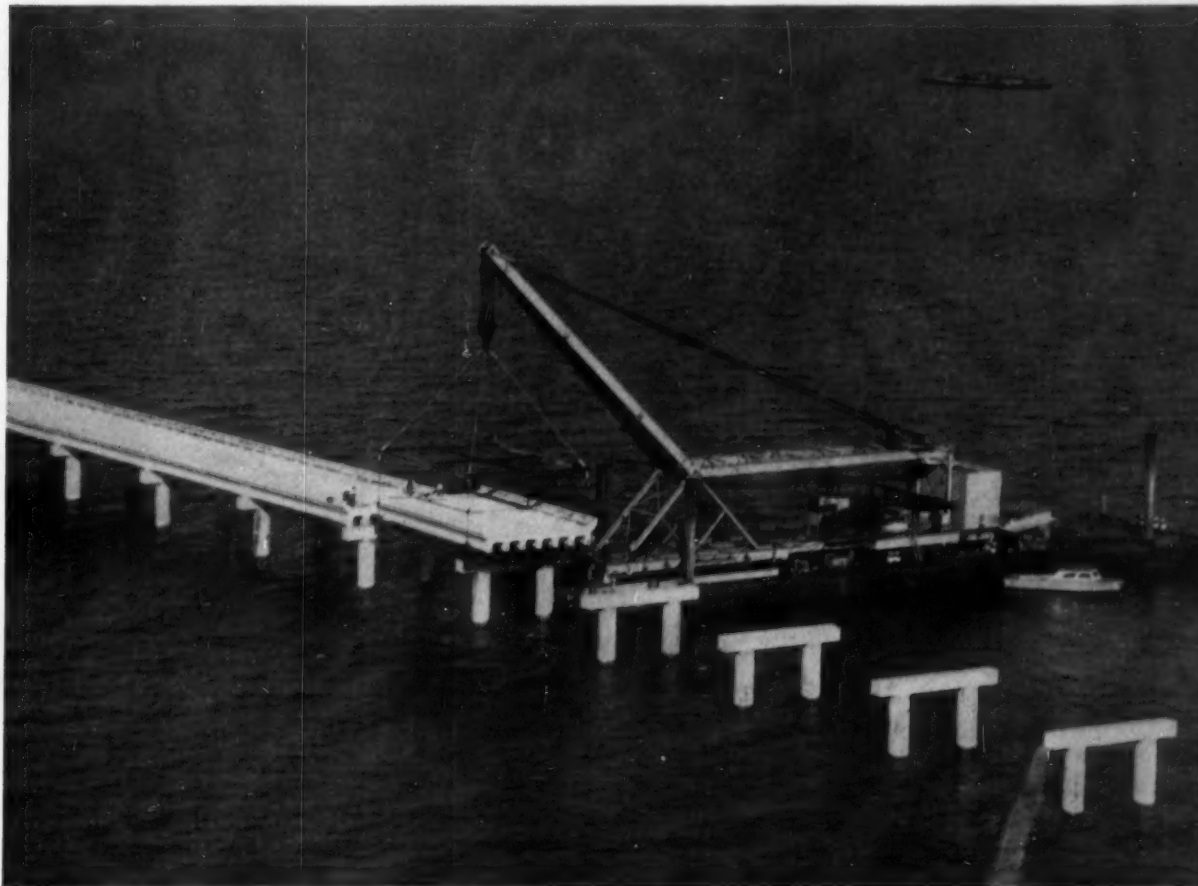
The derrick operated only as a hoisting mechanism. The boom and all other parts of the frame were fixed. To counteract the weight of the slabs, a 40,000-gal water tank was mounted on the back of the derrick.

Here's how a typical slab was placed. Barges carrying two slabs each were towed to the derrick barge and pulled up near the port side. Each slab was supported

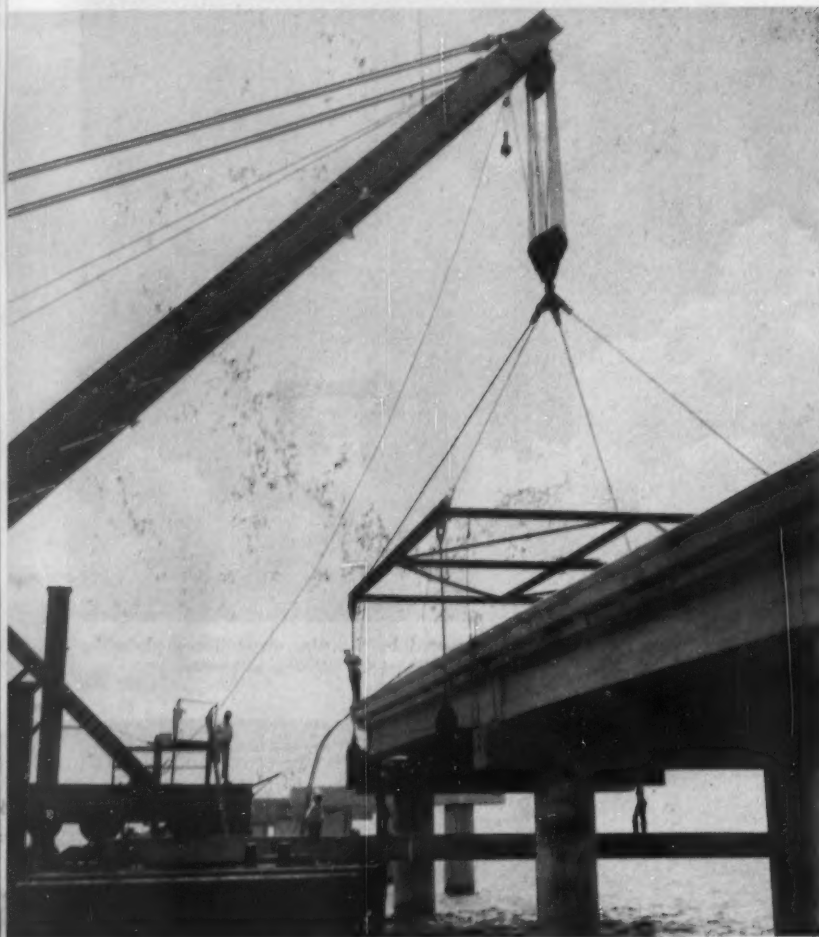
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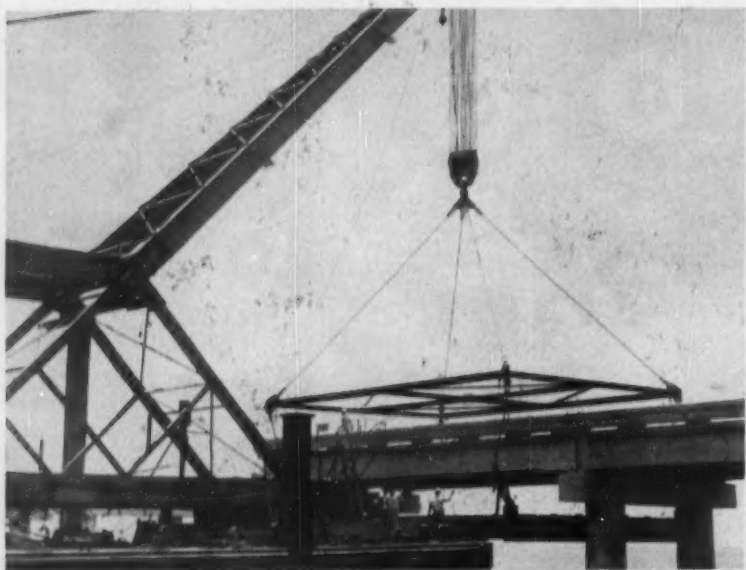
MAIN HOIST is American 3-drum unit powered by Cummins diesel through Twin-Disc torque converter. It also mounts two small side drums for handling barge lines.



SLAB is lowered on to caps and tied to anchor bolts. Metal cones fitted over ends of anchor bolts help make connection with holes in slab's bearing plates. Derrick barge maneuvers itself with four anchor and swinger lines operated by Clyde hoists.



FIXED BOOM projects far enough over bridge to allow derrick barge to keep safe distance from piles. A 40,000-gal water tank mounted behind rig serves as counterweight.



STEEL CRADLE which supported slab during placing is lowered on to pair of outriggers rolled forward from front end of barge. Cradle then is returned to supply barge.

on a cradle consisting of heavy steel beams.

When the slab barge pulled up, the derrick barge swung to port by pivoting on a rear spud. Two Clyde hoists powered by Waukesha engines handled four anchor lines and four swinger lines.

Hoisting Slab

The derrick was maneuvered over the slab barge while a rectangular lifting frame was lowered slowly. When the frame's four pickup lines were hooked to the cradle, the slab was hoisted from the barge. A 22-part line operated by an American 3-drum hoist raised the 200-ton unit as the derrick barge gradually pivoted itself back to a position perpendicular to the bridge. Further adjusting of anchor lines pulled the derrick barge toward the bridge until the suspended slab hung over the caps. Carefully, the slab was lowered until holes in the slab's bearing plates fitted over the anchor bolts in the caps.

The next job was removing the cradle from under the slab. This was done by rolling two beams forward from the front of the derrick barge. Serving as outriggers, they received the cradle and held it until the barge backed away from the bridge. The derrick then picked up the cradle, returned it to the barge, latched on to the remaining slab, and repeated the operation.

Slab placing was probably the smoothest operation on the lake. The crew became so efficient that they could handle the plant's daily quota of eight slabs and still have time left over.

Although most of the bridge consists of precast slabs, there are two bascule openings, each having a horizontal clearance of 75 ft. To meet navigational requirements, there are also three humps, each providing 56 ft of horizontal clearance and 25 ft of vertical clearance. A turnaround is 9 mi from shore.

Personnel

James E. Walters was project manager, David Milhan was chief engineer, James Quillan was day shift superintendent, and Walton Gasaway was night shift superintendent for Louisiana Bridge Co. Brig. Gen. Joseph Twitty, USA (ret.) was chief resident engineer for Palmer and Baker, Inc., who designed the bridge and supervised construction.

Now... Talk through noise

NEW TRANSISTORIZED POWER VOICE speaker



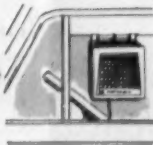
*The secret is in
the exclusive
"GOLDEN HEART"
transistor*



New POWER VOICE speaker
mounts firmly under dash
in same familiar position

BUT...

detaches in a second to be
hung from vehicle window
and may be heard clearly
hundreds of feet away.



Hear your mobile radio

HUNDREDS OF FEET AWAY

Now your vehicles, in fact any mobile radio equipped vehicle, can get far greater volume than ever before, with the new Motorola transistorized Power Voice Speaker.

This new compact, inexpensive speaker-amplifier combination delivers 10 TIMES MORE POWER than the conventional passive speaker. No more straining to hear messages. Just turn it up—it's got all the volume you'll ever need, all in this one small package. No longer is your driver shackled inside his vehicle...he can move about freely, hundreds of feet away, and still hear his dispatcher.

Secret of Motorola's newest development is the built-in transistorized amplifier, utilizing two long-life, Motorola power transistors. With the average 12 volt mobile radio system, the new speaker develops 15 watts audio output. Even on a 6 volt system, you get 5 watts output—much more than the conventional one watt speaker level.

This power packed speaker is available for your mobile 2-way radio NOW. It can be quickly and easily added to most 6 or 12 volt installations. With the new Power Voice Speakers doing a bigger, better job for you, you'll also find low battery drain, bandpass response that accents voice frequencies, and versatile Quick-detach mounting...in a compact, all-metal housing.

You must *hear* the new Power Voice Speaker to appreciate what this added power can mean to you. Write, phone or wire today...or mail the coupon below.

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NEWEST in TRANSISTORIZED EQUIPMENT

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MAIL THIS COUPON FOR LITERATURE or a demonstration

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METAL CONSTRUCTION

SIMPLIFIED
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STARTING BATTERY

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ENGINE AND GENERATOR

NON-PROJECTING
GENERATOR

**NOW—AVAILABLE IN
200-, 300-, 400-AMP
MODELS**

Prove it to yourself—
Make this actual feature-by-feature comparison of General Electric engine-driven welders with two other lines of engine-driven welders. You will see that only the new G-E welders have so many advanced design features for better welding at lower cost.



EASILY PRESET Electrode Selector, Current Dial—Dual controls make current setting easier and more accurate.

GENERAL ELECTRIC	✓	
MANUFACTURER A	Q	
MANUFACTURER B		

How General Electric's **NEW** Line of Engine-driven Welders Can Help You Meet Contract Deadlines

**Advanced design assures less "downtime," minimum maintenance—
for faster, lower-cost welding**

Nothing stretches out construction time more than unreliable or obsolete equipment. Such equipment increases your maintenance costs and results in non-productive "downtime." It may even lead to contract fines and loss of repeat business.

To reduce construction delays, General Electric's new line of engine-driven welders has been designed and field-tested for maximum durability and minimum maintenance—without sacrifice in performance. These new 200-, 300-, and 400-amp welders save for you with the following advantages:

SAVE YOU TIME—Sturdy construction, the dependable Hercules engine, new-design generator, and simplified control all combine to give you steady output, longer operating time between overhauls, and reduced maintenance. This means more production per machine . . . per man-hour.

SAVE YOU MONEY—General Electric engine-driven welders begin saving you money the first day on the job. For example, the deep-sump crankcase provides complete lubrication to all moving engine parts—up to a 15-degree tilt in any direction. This helps to reduce costly breakdowns. And the over-all advanced design assures you of more and better welds at less cost, with a reduction in costly downtime for maintenance and repair. Additional General Electric advantages are described below.

For more information about how General Electric engine-driven welders can help you, contact your nearby General Electric Welding Distributor. He is listed in the yellow pages of your telephone book. Write for descriptive bulletin to Section 714-5, General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL  ELECTRIC



CONSTANT-PRESSURE Brush Springs—Right pressure maintained for life of generator brushes without adjustment.



PRELUBRICATED Generator Bearings—Ball bearings prelubricated with sufficient grease for years of service.



DEPENDABLE Geared Governor—Gear-driven governor maintains close speed regulation for best welding.



PUSHER-TYPE Engine Fan—Large diameter pusher-type fan circulates ample cooling air for engine and generator.



CONTROLLED CURRENT Peaks—Current peaks are controlled. Arc can be crowded with no "stumbling" or "freezing."

	✓		✓		✓		✓		✓
		✓		✓		✓		✓	
						✓			



**Always
replace a
HYATT
with a . . .**

HYATT

WHY? In the first place, it's easier and quicker to install another HYATT Hy-Roll than another make. You're sure of a perfect fit—because HYATT Hy-Rolls are precision-built and they're *completely interchangeable*.

But far more important, you're sure of the same long, smooth, dependable bearing service the manufacturer originally built into his product. The reason he specified HYATT Hy-Rolls was to assure you the best possible performance. *Isn't that a good reason for you to specify them again?* Hyatt Bearings Division of General Motors, Harrison, New Jersey.

Watch "WIDE WIDE WORLD" Sundays on NBC-TV



**Always look for this familiar blue
and yellow box—when it comes to
quality, there's no substitute for**



HYATT **Hy-ROLL**
ROLLER BEARINGS



Rolling with both steel and rubber ...

Light Rigs Cut Compaction Costs

SIZE ALONE doesn't always make for high production and efficiency—even in compaction equipment. Kramp Construction Co. of Milwaukee, Wis., is getting top-notch results from a team of relatively pint-sized compactors that costs only about half as much to own and operate as heavy rollers and the tractors needed to haul them.

Kramp's job is a 1,000,000-cu yd site preparation contract for the big Mayfair Shopping Center in Wauwatosa, just northwest of Milwaukee. About 80% of this yardage must be cut from the high ground on the north end of the site and placed and compacted at the

south end. Maximum depth of fill is 14 ft. Hauls range from 300 ft to about 5,000 ft.

Originally, Kramp planned to handle compaction with heavy sheepfoot and pneumatic-tired rollers pulled by two D8's. But just before work began, Kramp president L. B. Krause saw a demonstration of a new, self-propelled unit designed by Harry J. Seaman of Seaman Engineering and Research Corp. for Seaman-Gunnison Corp.

This rig—called a Duo-Pactor—combines steel and pneumatic rolls to obtain higher densities than either steel or rubber alone will

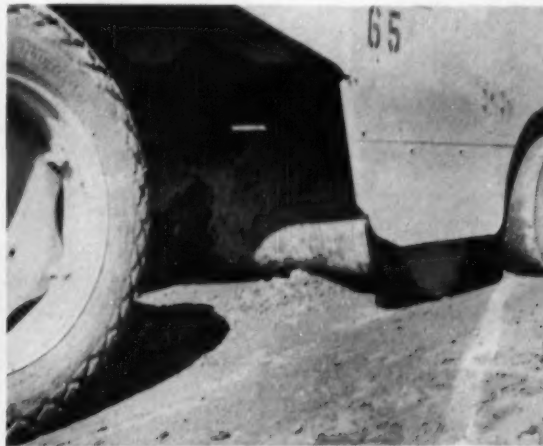
produce in the same number of passes. It is powered by a modified International Utility tractor.

Kramp first experimented with one Duo-Pactor and found that it uniformly met or exceeded specified densities, producing up to 108% of Proctor in some instances. So the contractor put two more on the job to compact the entire 800,000-cu yd fill. A sheepfoot is available to break up large clods.

The Duo-Pactor has a basic weight of six tons and ballast capacity to bring working weight to a maximum of 19 tons. Kramp ballasts each rig with only six additional tons of sand and gravel



PNEUMATIC ROLL includes eight small diameter tires to develop high unit pressure under roller with comparatively light weight.



STEEL ROLL is a thick shell mounted so that it may roll slightly above pneumatic roll or with pneumatic roll raised completely.

Light Compactors . . . continued

because a 12-ton total is ample to meet specifications.

"At first," Krause said, "we thought it would be impossible for the 46-hp tractor to handle this kind of load. But we found it had ample capacity for all normal operations."

"Occasionally, of course, it's necessary to give one of the Duo-Pactors a push when it hits a wet or unusually soft spot. But that's also true with big equipment."

The International 300, with Torque Amplifier drive, provides 10 speeds forward and enables the operator to change speed on the go in any of the five regular gears without interrupting power flow to the drive rolls. Speed range is from 1.8 to 16.7 mph with engine at full rated speed. Steering and roll control are hydraulic.

The front pneumatic roll, which

is also the unit's driving assembly, is composed of four 11.00x28 non-directional four-ply tires inflated to a pressure of 15 to 20 psi and mounted in pairs on each side of the differential of the tractor.

The rear pneumatic roll is composed of eight 7.50x15 smooth, flat crown, six-ply tires inflated to a pressure of 45 to 50 psi. They are mounted in pairs on a leaf spring that provides a wide range of vertical travel. The torsional flexibility of the leaf spring controls the oscillation of wheel pairs.

The steel roll is a thick shell mounted on pillow block bearings that locate the roll shaft by means of set-screws. A linkage connects the steel roll with the rear pneumatic roll so that when either one is raised completely, the other is down. The rubber and steel rolls also may be positioned so that the

steel roll is slightly above the pneumatic roll, in position to roll out any bumps.

With its three Duo-Pactors, Kramp compacts a daily average of 16,000 cu yd of material. Usually fill is spread and compacted in 6 to 12-in. lifts, but thicker fills have been compacted satisfactorily.

Kramp officials say they gained two additional advantages with the Duo-Pactors. "We found the three lightweight units gave us greater flexibility than two heavier units. Sometimes, all three units worked together on a single fill. At other times, we could keep the scrapers moving faster by having three separate fills going on at once with one Duo-Pactor assigned to each."

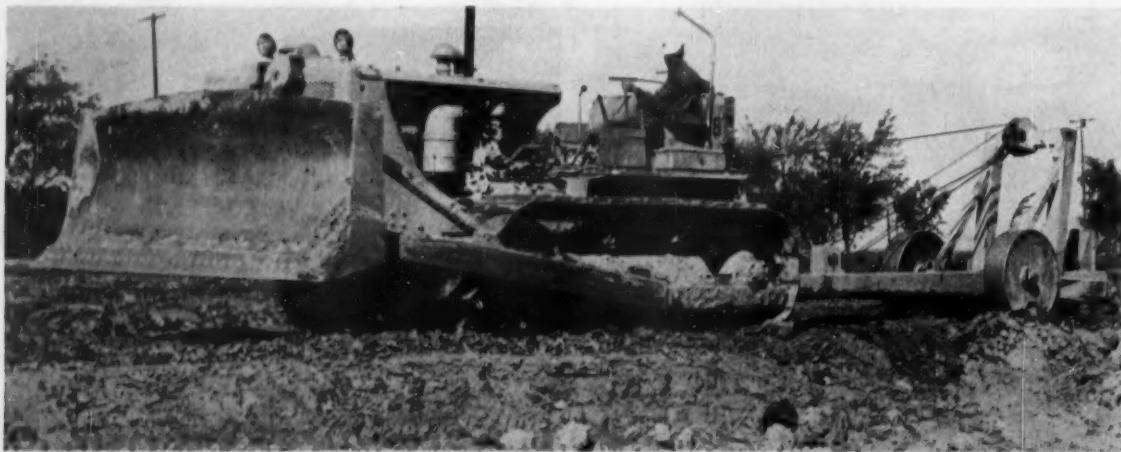
"Another important advantage—especially during August when we had several heavy rains—was use of the steel roll to keep the fill smooth. Each day's fill was compacted and rolled smooth before the Duo-Pactors shut down for the night. We keep a slight grade on the fill at all times so that water runs off the dense, smooth surface as fast as it falls, and waiting time after heavy rains is reduced."

Kramp's earthmoving equipment on the job includes five LeTourneau-Westinghouse scrapers pulled by Cat D8's, six Cat DW21 scrapers, four No. 12 graders, one D7 with sheepfoot roller for clod-busting, one Cat Model 977 tractor with loader; one D9 dozer, one HD-21 Allis-Chalmers dozer; two HD-20 pushers, three Cat D8 dozers; two D8 U-blade dozers; two D2 tractors; one D4 dozer; one Northwest crane; one Northwest 1½-yd shovel, and one LeTourneau-Westinghouse ripper.

Big Machines Handle Clearing, Earthmoving



CLEARING THE SITE takes a variety of heavy equipment like the Cat D9 shown uprooting a big tree. Contractor has almost 50 pieces of heavy equipment at work on the job.



RIPPING CLEARED LAND for scrapers is a LeTourneau-Westinghouse two-tooth ripper, pulled by Cat D8. The job involves moving

1,000,000 cu yd of earth, and about 80% of this total yardage must be placed and compacted at the low end of the site.



Cutting the New York State Thruway past Suffern, N. Y. required a 112-hole side hill shot only 100 ft. from houses. Using Atlas explosives and techniques, the 1,100 lb. blast was set off with few townspeople realizing it!



Carving the Schuylkill Expressway close to Philadelphia homes and factories brought the order, "hold down noise and vibration." The Atlas ROCKMASTER® millisecond delay pattern triggered an efficient, muffled blast—held the "good neighbor policy."



Blasting along Central Avenue with the eyes and ears of Yonkers upon you calls for Atlas millisecond delays in an alternate pattern. Results: excellent breakage with no loud air snap . . . no complaints.

**when NOISE
is the problem . . .**

**PROLONGED
CONFINEMENT
COUNTS**

**Atlas explosives and
Atlas methods . . . the
right cost-cutting
combination**

THE right combination of Atlas explosives and techniques provides *prolonged confinement* of explosive force—results in better throw control, improved breakage, minimum noise and vibration.

Before your next blast, why not talk over the specific problems with your Atlas representative. He'll help you get the best all 'round results. And write for "Better Blasting"—Atlas' informative newsletter on latest methods and materials.

EXPLOSIVES
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WILMINGTON 99, DELAWARE
offices in principal cities

From New Orleans to Ketchikan "Small" CAT* Diesel Tractors Lick "Big" Jobs

Caterpillar D4 and D2 Tractors, for their size and weight, are as rugged machines as ever wore yellow paint. There are hundreds of jobs they can do just as efficiently as their bigger brothers. And contractors are proving it.

The four tractors shown here are working in localities as far apart as Alaska and Louisiana, and none of them is on an easy job. One owner, John Hannigan, of Philadelphia, puts it this way: "They're tough. I'd never buy anything else. They'll outwork other makes any time and any where. The only repairs I've made on this D4 in three years were adjustments to the main clutch, tracks and steering brakes."

Both the D2 and the D4 are built to handle the tough jobs, right up to their capacity, all day long and month after month. Yet they're small and compact enough to work in cramped quarters—tunnels or narrow city streets. Both are economical to operate, and

maintenance costs are consistently low, because they're *quality* built to stand up under punishment. Their dependable Caterpillar Engines have flywheel capacities of 48 HP for the D2 and 63 HP for the D4.

Let your Caterpillar Dealer show you how one of these smaller Cat Diesel Tractors will fit into your construction work and save you money. He backs their long work life with reliable service and Caterpillar parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

NEW ORLEANS

Taking the "blues" out of Basin Street, this Cat D2 Tractor, owned by Boh Brothers Construction Co., New Orleans, La., is helping widen the famous thoroughfare to 44 ft. on each side of a center parkway. Old St. Louis Cemetery shown in background.



TORONTO

Poee Construction Co., of Toronto, Ont., owns this D4 with No. 4A Bulldozer, shown 'dozing fill into a bend of the Humber River. This is a diversion job, digging a new channel to prevent flooding, and moving the earth into the old river bed.



KETCHIKAN

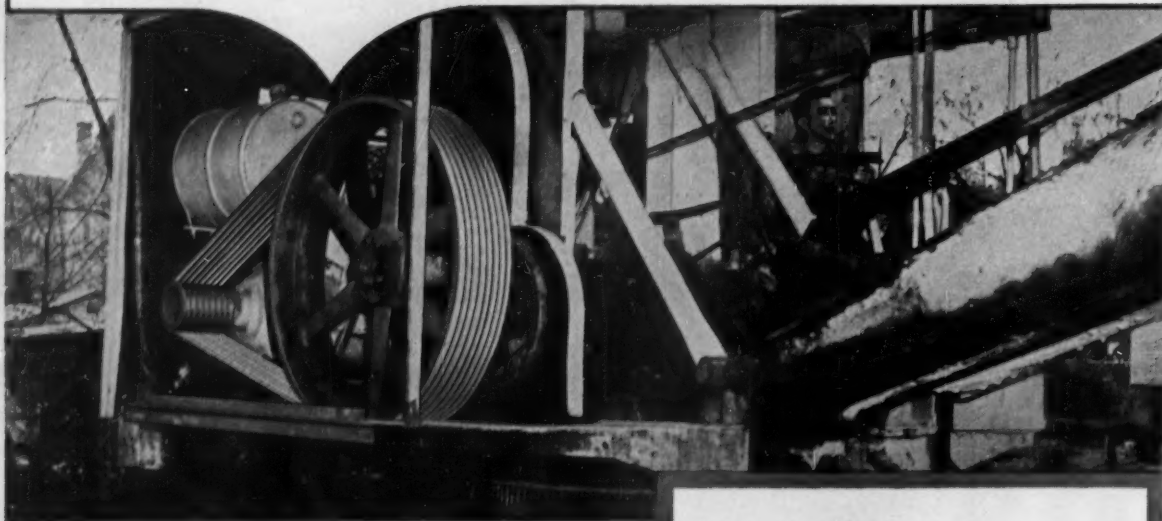
The D2 helped Manson-Osberg Co. in the construction of a 7 ft. x 8 ft. hydroelectric tunnel through granite rock near Ketchikan, Alaska. Equipped with scrubbers, the tractor worked the whole length of the 4000-ft. tunnel, moving out over 1000 cu. yd. of rock.

PHILADELPHIA

Here the D4, owned by Contractor John Hannigan, rips up old concrete foundations and rough grades for a new driveway and parking area at one of the Penn Fruit Co. supermarkets, in Philadelphia, Pa.



These super-tough V-belts saved construction firm \$1,600 first year



How Gates Super Vulco Rope solves tough drive problems

Wherever . . . whenever . . . you have a tough drive problem—the problem of handling shock loads, of overcoming heat and weather, or of limited space—have one of our belt specialists show you how the problem can be solved with a Gates Super Vulco Rope Drive.

For example: Bise & Shortt, General Contractors, of Clintwood, Virginia, had a chain drive on their one-yard power shovel shown above.

After six months of use, the worn chain would whip under load, causing both chain and sprocket to wear out still more rapidly. New chain had to be installed every year.

Then Ayers Shortt called in a Gates engineer to solve the problem. With space limited and severe shock loads a factor, the Gates man recommended a Gates Super Vulco Rope Drive for lowest initial cost and continuing economy. "The shovel runs like new," says Mr. Shortt, "and every year the Gates drive is saving us the \$1,600 it cost in parts and lost time to replace the chain drive."

Gates offices and distributors are listed in phone book yellow pages in all major industrial centers. The Gates Rubber Company., Denver, Colorado—*World's Largest Maker of V-Belts.*

The Mark of



Specialized Research

No Other V-Belt has

ALL these Advantages

1. Tough, resilient Tensile Cords



Super-strength tensile cords provide 40 % greater horsepower capacity . . . easily absorb heavy shock loads . . . reduce number of belts required . . . save weight and space.



2. Concave Sidewalls (US Pat. 1813698)



Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt . . . far longer belt life.

3. Flex-Weave Cover (US Pat. 2519590)



Provides greater flexibility with far less stress on fabric. Cover wears longer . . . increases belt life . . . more power available to driven machine.

4. High Electrical Conductivity

Built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

5. Oil, Heat, Weather Resistant

Special rubber compounds make Super Vulco Ropes highly resistant to heat, oil, and prolonged exposure.

TPA 117

Gates SUPER VULCO ROPE Drives

Forming the roof . . .



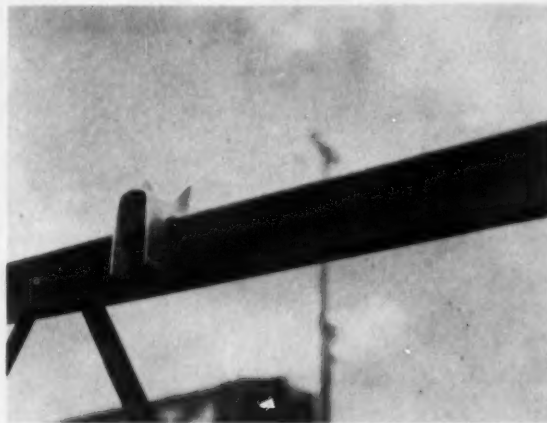
CORRUGATED STEEL FORMS roll out easily over joists. Manufacturer precuts sheets at factory before shipping them to job.



SIDE CLIPS secured to bar joists prevent steel forms from buckling upward. Corrugations provide strong rib support.



STEEL SHEET is locked into place after first being fitted to clip. Standard double-pronged clips fit easily over joist flange.



TABS, cut in the corrugated steel at the lap, anchor the galvanized wire reinforcing mesh for the vermiculite concrete.

Fireproof Roof Goes On Fast

FAST INSTALLATION is a feature of the 291,000 sq ft fireproof roof system on the Great Southern Shoppers Mart, Bridgeville, Pa.

The system consists of a slab of vermiculite insulating concrete poured on corrugated steel forms welded or clipped to bar joists. Thickness of the concrete varies from 2 to 3 in. over the top of the form corrugations. Ceilings are suspended diamond mesh metal lath fireproofed with $\frac{3}{4}$ in. of vermiculite plaster.

The 2-in. thickness of concrete with its reinforcing mesh, weighs 5 psf and has a 3-hr fire rating. Total weight—including the form, suspended ceiling, and built-up roofing—is 17½ psf.

The giant shopping center is

made up of five buildings grouped to form a hollow rectangle around a central parking area. The property covers 35 acres about 11 mi from downtown Pittsburgh. There are about 20 different roof levels ranging from about 14 ft to 30 ft above grade.

Building Procedure

The main steel beams are supported by steel columns 25 ft on centers. Welded to the beams are bar joists spaced 37½ in. on centers and spanning 20 to 25 ft. Long-span joists were used on spans up to 60 ft, spaced 36½ in. on centers.

The deck slopes $\frac{1}{8}$ in. in 1 ft to the rear of the building. This is effected by setting the joists prog-

ressively lower. Pairs of pencil rods, one above the other and spaced about 8 ft on centers, pull the joists plumb and provide for lateral bracing.

The manufacturer precut the corrugated steel forms to proper lengths for each section. A typical sheet was 9 ft 5 in. long and 26 in. wide. Cover width was 24 in. with a 1-in. overlap on each side. Sheets were placed at right angles to the bar joists and anchored with side clips placed about 12 in. on centers on alternate sides of the joist. Where the sheets overlapped at the ends, a clip was placed on each side of the joist and another clip at intervening joists.

After a section had been placed, a vent clip was inserted on the lip

Concreting



TOWER AND HOISTING UNIT lift concrete by 1 cu yd bucket to roof hopper. Versatile rig is a Mixermobile combination unit.



CONCRETE is placed by buggy. Movable bulb tee set on 2x4's serves as a bay divider and as a seat for finishing screed.



ALUMINUM FACED SCREED, made by securing strip of aluminum to a 2x4, helps speed finishing. Concrete does not stick to aluminum.



HAND TROWELING finishes rough spots and touches up many pockets which form through use of 1:6 mix of vermiculite concrete.

FIREPROOF ROOFS . . . continued

of each sheet between each purlin—one clip for every 3 lin ft. A four-man crew laid about 10,000 sq ft a day—one man supplying sheets, three men installing them.

The 4x4, 12/14 gage galvanized wire reinforcing mesh for the concrete was laid on the form at right angles to the bar joists. Mesh was anchored by cutting a tab in the sheet at the lap and bending the tab over the mesh. Two men placed about 16,000 sq ft of mesh a day.

The vermiculite concrete was a 1:6 mix (1 part portland cement to 6 parts vermiculite aggregate by volume). It was mixed and elevated to a roof hopper by a mobile unit equipped with a water feeder.

From the hopper the concrete was buggied to bays 14 ft wide. Screeding was done with an aluminum-faced 2x4 about 15 ft long, which was pulled forward by a man at each end and a man at the

middle. Screed pockets and rough spots were smoothed with a trowel.

Screed strips were sections of 2-in. bulb tees 16 ft long, set up-right to give a uniform 2-in. thickness over the top of the corrugations. Where 3 in. was specified, the tees were placed on edge on top of the 2x4's.

Bulkheading the Slab

Since all of the buildings have parapets which were erected after the concrete was placed, it was necessary to leave a 2-in. clearance for the bricklayers. To keep the concrete from running off the deck, bulkheads were made of 2x4's nailed together at right angles to each other. Some 30 bulkheads—enough for a day's pour—were made up before the job started.

Continuous marquees, totaling 18,000 sq ft, are cantilevered out 7 ft from columns. Joist spacing is 48 in. on centers. Since the marquees will support large signs, they

are braced inside with rigid supports under the bar joists to distribute the loads. The vermiculite concrete slopes to drains and tapers in thickness from 5 in. in front to 2½ in. at the rear.

A crew of six men plus the job superintendent placed an average of 4,000 sq ft of concrete daily. The under side of the form showed almost no drop-through of concrete at laps and little deflection. Placing the deck cost 40¢ psf.

After the deck had cured for about five days it received a 3-ply built up roof made up of three layers of felt mopped over with asphalt and finished with gravel.

Men on the Job

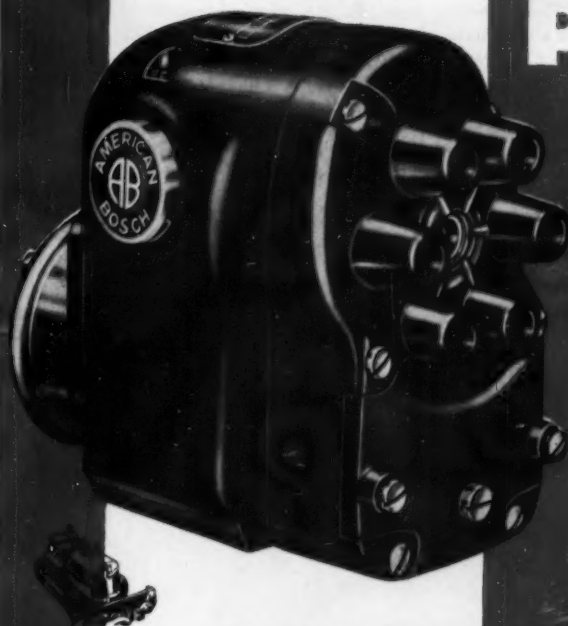
The Great Southern was designed by C. Melvin Frank, and erected by Skilken Construction Co., both of Columbus, Ohio. The deck was installed by Vermiculite Placing Pittsburgh Co. under the supervision of Hugh Hamilton.

Right from the start...

FAST



POWERFUL



**FOR CONSTRUCTION
INDUSTRY SPARK
IGNITED ENGINES**

In dozers, gas-engine driven compressors, pumps, graders, paving machines and spreaders . . . wherever they are in use in Construction equipment engines, American Bosch Magnetos deliver consistently dependable performance in continuous, heavy duty service.



**AMERICAN BOSCH
MAGNETOS**

Fast, powerful—that's the power-packed story of American Bosch Magnetos—today's finest ignition units for construction industry engines. Many advanced features give these famous Magnetos greater power for split-second starting. PLUS the built-in stamina that assures years of constant, trouble-free service in construction engines. That's why they're so widely used as original equipment by so many leading engine builders.

For your every replacement need, there's an American Bosch Magneto precisely engineered for maximum efficiency at all operating speeds and loads. Moreover, American Bosch can serve you well with all the advantages of one of the world's largest and most efficient Service organizations. There's an AB Service Agency near you. Write today for application data on your largest heavy duty engines right down to today's compact, high-speed power units. American Bosch, Springfield 7, Mass. A Division of American Bosch Arma Corporation.

AMERICAN BOSCH



**Automotive and
Aviation Magnetos**



**Generators and
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**Components for
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**Small
Electric Motors**



**Electric
Windshield Wipers**



**Diesel Fuel
Injection Equipment**

How job site batching with Noble-Mobile supplier \$920,000 contract of 5 stationary plants



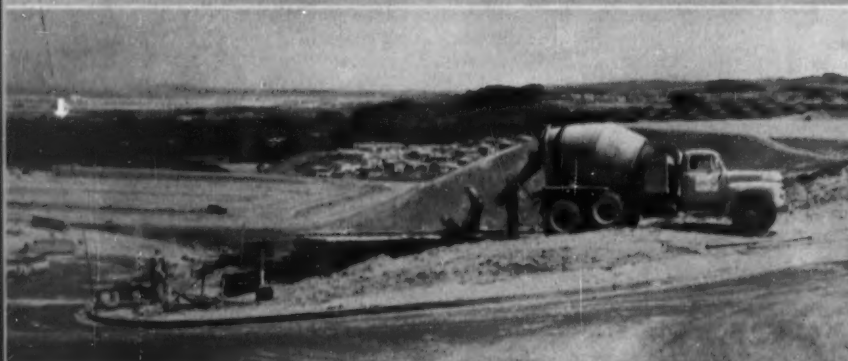
On the southern outskirts of San Francisco above San Bruno is a 5000 acre hillside area of new subdivision and shopping center construction. 6 ready-mix suppliers were in position to bid on the contracts: 5 stationary plant operators and Cupertino Concrete Co., the one Noble-Mobile batching plant on wheels operator. Cupertino was able to take the job at a price 8% below the nearest competitor yet make a profit averaging 6%. By driving his Noble-Mobile to the job site and producing there, Cupertino reduced transit truck hauls to a maximum of 2 miles and saved over 50% on hauling costs. Each Cupertino transit truck works an average of 6 hours a day making up to 12 trips of 5 yards per trip, totaling 60 yards of concrete per day per truck. 60 yards supplied from the

nearest competitive stationary plant would have required 2 to 3 trucks. Cupertino saves up to 8 transit trucks.

When the job started in August, 1954, Cupertino located the Noble-Mobile in the center of the first project so the maximum haul would be only 1 mile. On completion of that project and the beginning of another project 1.5 miles distant, Cupertino closed shop on a Friday night and by the following Monday morning had dismantled, moved and reassembled the Noble-Mobile in the new location and was delivering concrete. The cost of setting up the Noble-Mobile in the new location was a mere fraction of what it would have been to install a stationary plant. Saved were the weeks and even months wasted in cutting through legal red tape to secure permits and complete construction. A further source of profit is the do-it-yourself residents of the newly completed homes.



Batching plant on wheels driven to the job site saves erection costs, taxes, site availability problems. Purchase is easier to finance than stationary plants. Pays for itself in savings from shorter hauls. Saves outlay for extra transit trucks and cost of depreciation. Many producers maintain one or more Noble-Mobiles in reserve to handle sudden surges of business and to discourage competitors from stepping in.



Pouring site on 16 per cent grade 1.9 miles below Noble-Mobile plant. Arrow points to closest stationary plant 3.4 miles distant. Noble-Mobile was stationed above construction area so all hauls would be downhill. Competitors had to compute costs on slow, ponderous up-hill drags.

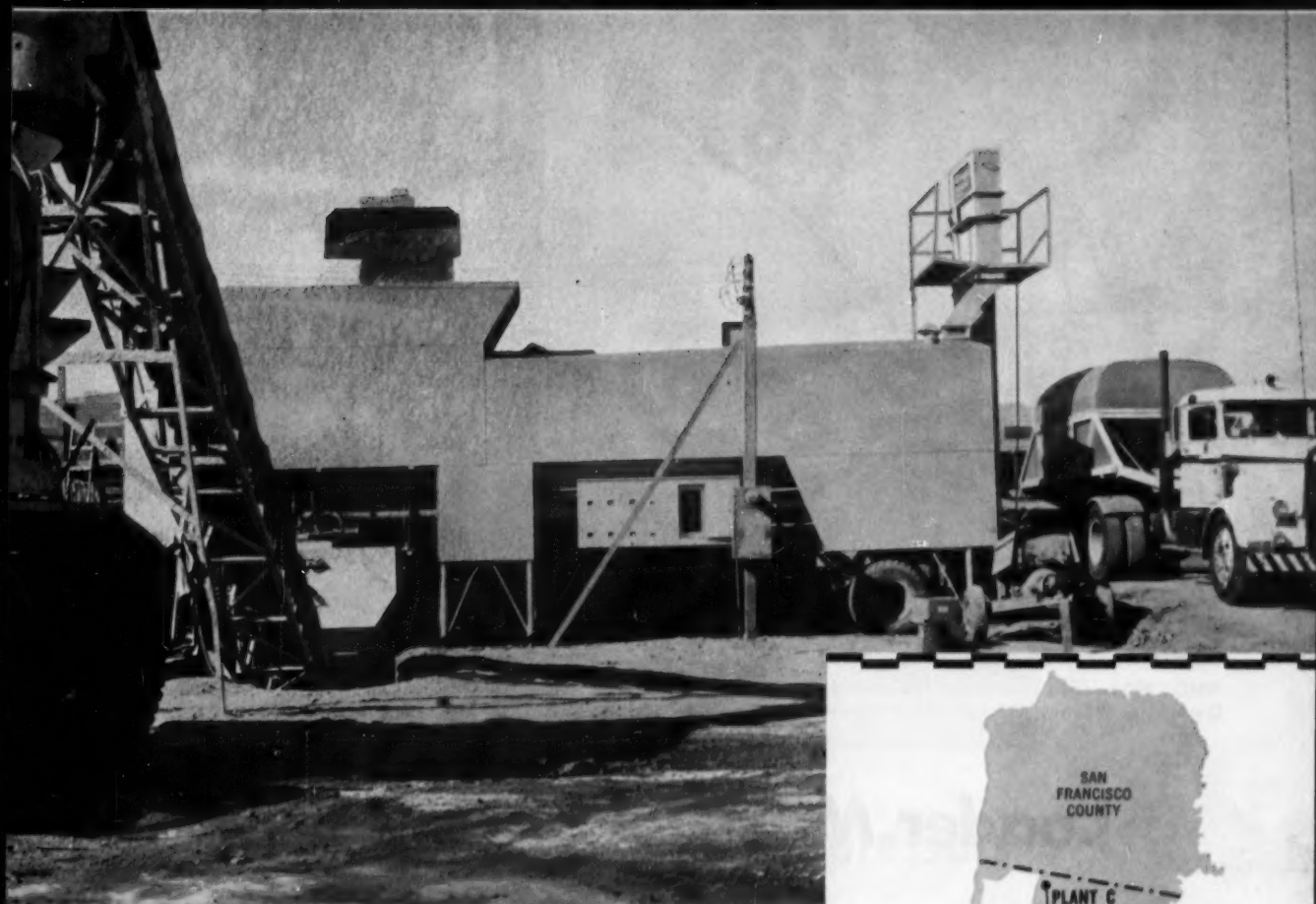


Concrete for 10,000 homes in a 10 year building program! \$35,000 Noble-Mobile batching plant, located 2 miles above, supplies concrete for foundations, sidewalks, retaining walls, driveways, patios.

NOBLE-MOBILE
Batchmobile
Covered by patents pending

WRITE FOR CIRCULAR
THE NOBLE COMPANY • 1860-7TH ST., OAKLAND 20, CALIF. • TEMPLEBAR 2-5785
Branches: 20950 Center Ridge Road, Cleveland 16, Ohio. EDison 1-3426
518 First Ave. North, Seattle, Wash. MUtual 4878
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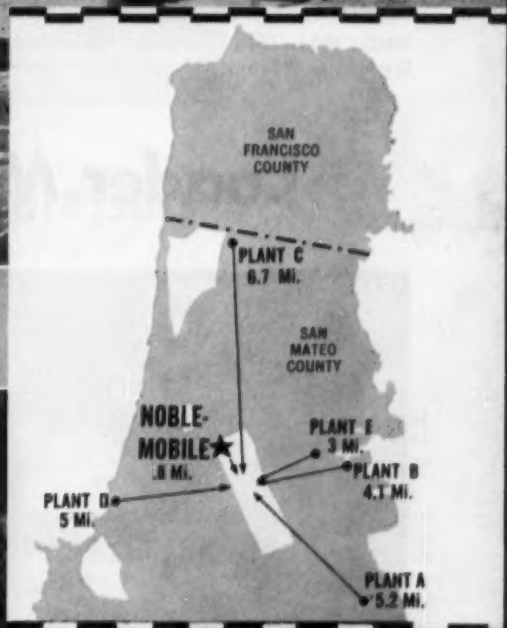
NOBLE-MOBILE got at 6% profit against bids



Supplies up to 400 yards per day to transit trucks. Bulk cement storage with truck hopper unloading screw and elevator. Weighs aggregates and cement separately and simultaneously. Automatic or semi-automatic control. Set up in 1 day. No field wiring, concrete foundations or crane time required on base plant.

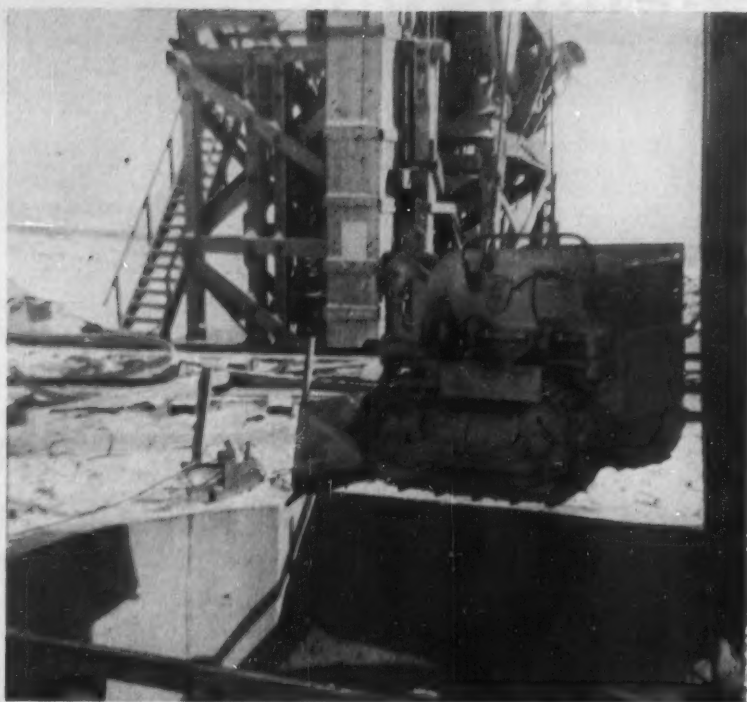


Fed by scooploader from aggregate and sand piles. Cost to haul aggregates, sand and cement from producing site to Noble-Mobile no more than to haul to general area where competitors' stationary plants are located. Plant may also be fed by conveyor or crane.

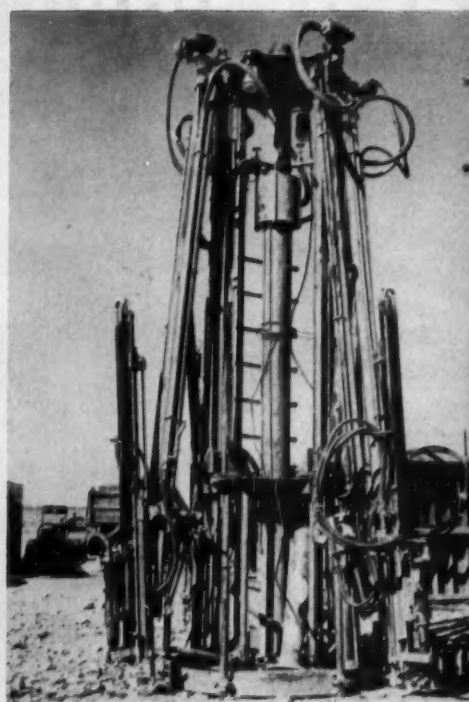


Map of construction areas south of San Francisco showing Noble-Mobile site and competitors' stationary plants — A, B, C, D, E. Note the .8 mile haul from the Noble-Mobile compared with the up to 6.7 mile hauls from the others. "Economics of job-site batching are so sound no outside stationary plant can compete," reports Bob Soldini, Cupertino Concrete Company.

DISTRIBUTORS: BIRMINGHAM, ALA., Equipment Service Co. • PHOENIX, ARIZ., Superior Equipment Co. • VANCOUVER, B. C., Westcoast Equipment Co., Ltd. • DENVER, COLO., Western Machinery Co. • BALTIMORE, MD., General Supply & Equipment Co., Inc. • CEDAR RAPIDS, IOWA, James W. Bell Co. • INDIANAPOLIS, IND., Manwaring Machinery Co. • DETROIT, MICH., E. G. Mueller Co. • ST. PAUL, MINN., Borchert-Ingersoll, Inc. • CLEVELAND, OHIO, Wapco Equipment Co. • LOS ANGELES, CALIF., Smith-Seath-Usher Co. • PORTLAND, ORE., Clyde Equipment Co. • PHILADELPHIA, PA., Farnival Machinery Co. • PITTSBURGH, PA., Equipment & Supplies, Inc. • AMARILLO, TEXAS, Plains Machinery Co. • DALLAS, TEXAS, North Texas Equipment and Supply Co. • HOUSTON, TEXAS, Boehck Engineering Co. • EL PASO, TEXAS, Border Machinery Co. • WACO, TEXAS, Richards Equipment Co. • SAN ANTONIO, TEXAS, Contractors Machinery Co. • SALT LAKE CITY, UTAH, Arnold Machinery Co. • SEATTLE, WASH., Star Machinery Co. • SPOKANE, WASH., Intermountain Equipment Co. • CASPER, WYOMING, Studer Tractor & Equipment Co. • MONTREAL, QUE., Laurentide Equipment Co., Ltd. • WINNIPEG, MAN., Huggard Equipment Co., Ltd. • BOSTON, MASS., Hodge & Mattheis Co. • LOUISVILLE, KY., Emmett C. Watson Co. • NASHVILLE, TENN., Paterson Machinery Co.



EIMCO 630 loader is lowered into 18-ft finished dia. shaft at soda ash plant in Wyoming. Dravo Corp. of Pittsburgh has perfected mechanized mucking of 1,600-ft deep shaft.



CLEVELAND JUMBO with four drifters waits to be lowered into shaft for next lift.

Loader Mucks Narrow Shaft



MUCK BUCKET with 2½-yd capacity is set against wall of shaft and loaded. There is little spillage, and loader has enough room to maneuver efficiently and safely.

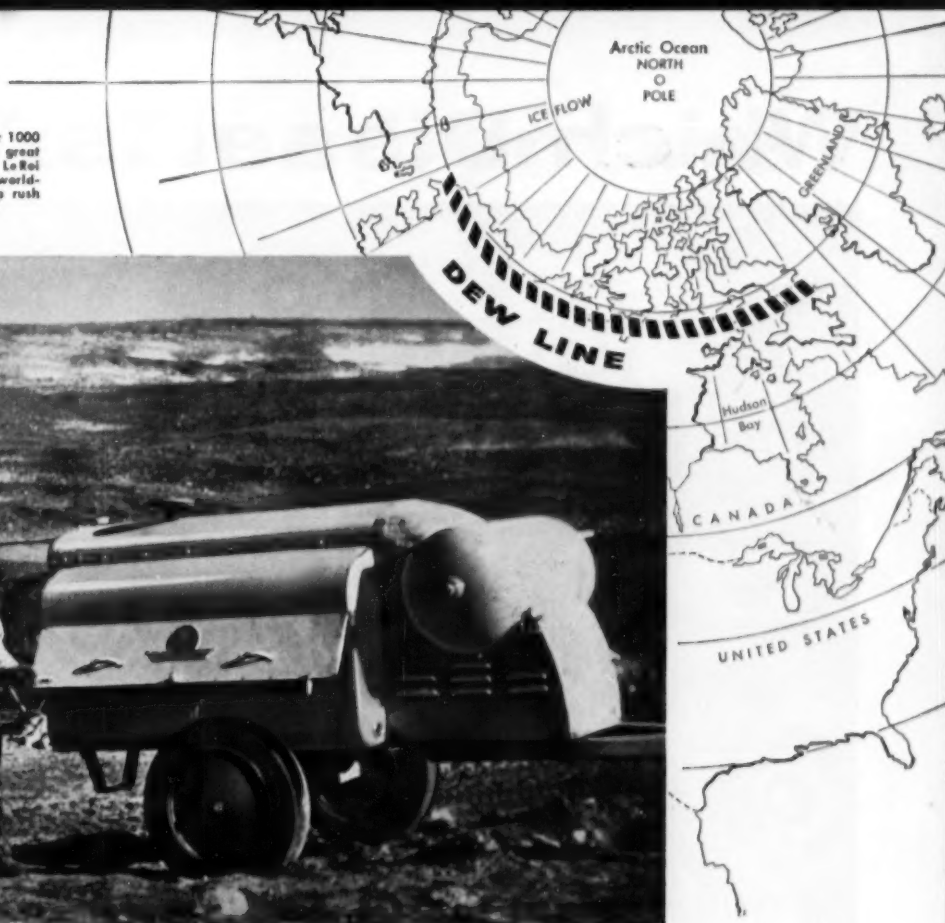
A CRAWLER-MOUNTED loader is proving that mucking of small diameter shafts can be mechanized to produce time and labor savings.

At Intermountain Chemical Company's plant in Green River, Wyo., Dravo Corp. of Pittsburgh is sinking a 1,600-ft shaft at the rate of 225 ft per month. Instead of a clamshell the contractor is mucking the 18-ft finished diameter shaft with an Eimco 630.

Two 2½-yd buckets carry muck to the surface. One is loaded as the other is hoisted, dumped, and returned. A bucket is set against the ribs on one side of the shaft as the Eimco crowds into the muck pile. When it gets a scoop full, the loader backs into the bucket and dumps. There is little spillage and plenty of room to maneuver. According to the contractor, the method is safer than a clamshell because there is only one hoist line and no chance of it getting entangled in the deep shaft.

T. M. Berry is superintendent for Dravo Corp.

The DEW Line (distant early warning line) is over 1000 miles from major sources of supply. Therefore, great reliance must be placed on equipment. That's why Le Roi compressors and Le Roi-Cleveland air tools, world-famous for dependability, were selected to help rush this important project to completion.



Dozens of Le Roi Compressors Defy Arctic Blasts on DEW Line

More than 1000 miles from major supply centers, Le Roi Compressors and air tools work around the clock, rushing completion of this major project.

Air power supplied by dependable Le Roi compressors is helping to build the DEW Line — a system of radar stations located in the icy waste lands of the Arctic. Thousands of tons of equipment have been flown into this white frontier land by the U. S. Air Force or landed on Arctic beaches by U. S. Navy convoys.

Construction activity is now moving at a fast pace. Soon the severe Polar winter will close in on the men and machines. Violent storms will sweep the area while temperatures plunge to 60° below zero. That's why only job-proven construction equipment is used on this important project.

Le Roi air compressors are designed and built to withstand the rugged, adverse conditions of the Arctic. These tough units will produce plenty of air power to operate tools and machines in this bitter land. Trouble-free and easy-starting, Le Roi air compressors, and efficient Le Roi-Cleveland air tools are now helping to complete this enormous job on schedule.

The Distant Early Warning Line, called DEW Line by the men on the northern frontier, will permit advance warning of any enemy plane attack approaching over the North Pole region. DEW Line radar stations will be able to keep day and night watch over the cold Polar sky. At the same time, radar stations along the

Mid-Canada and Pine Tree Lines, thousands of miles further south, scan the skyway approaches to U. S. and Canadian homes.

Design experience pays off. Le Roi has been building heavy-duty engines for more than 40 years and applying them to portable compressors. Today's Le Roi compressor with its matched engine and compressor-unit, all built by the same manufacturer, is the significant result of many years of engineering research and development work by Le Roi engineers and field technicians. That's why you find these machines on the DEW Line — and that's why you find them delivering many years of dependable service to contractors and other equipment users in everyday construction work.

G-177



LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

Which Diesel is "Public S



It's GM... America's First Choice Diesel... and here's why:

On countless projects—both construction and maintenance of essential public services—you find General Motors Detroit Diesel engines powering more different kinds of equipment than any other Diesel.

Reason for this high preference is that these compact 2-cycle Diesels get work done faster at lower cost—in road graders, snowplows, excavators, trucks, tractors, pumps, railway equipment and other mobile and stationary uses. They also power work boats, fishing vessels and pleasure craft.

And now winning the acclaim of users who want higher output are Detroit Diesel's great new

Turbopower engines. These new GM Turbopower Diesels develop up to 17% more power on no more fuel—or the same power with 15% less fuel!

Because of greater efficiency, and the fact they fit where bulkier engines won't, GM Detroit Diesel engines are installed by over 150 manufacturers in more than 1,000 different applications of power machinery. They step up output and cut fuel and maintenance bills on any job from 30 h.p. up.

You'll find it always pays to specify GM Diesel in the equipment you buy or repower. It's America's **FIRST CHOICE Diesel** because it does more work at less cost!

Servant" Number one?



Illustrated above are Adams motor grader; Warner-Swasey Gradall; Pettibone-Mulliken Speedall; Four Wheel Drive truck; Seaman-Andrews Trav-L-Plant. Write for list of over 1,000 applications.



DETROIT DIESEL

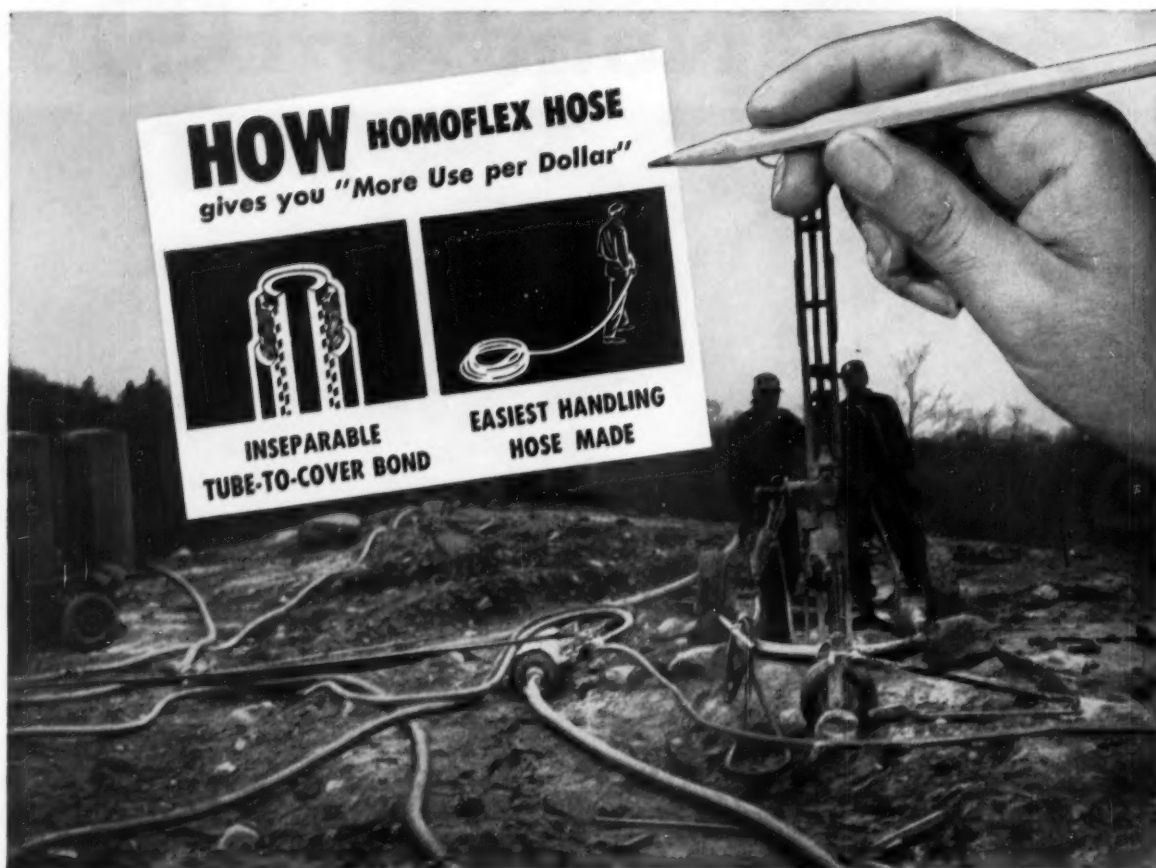
Engine Division of General Motors

Detroit 28, Michigan

In Canada: General Motors Diesel Limited, London, Ontario

Single Engines...30 to 300 H.P. Multiple Units...Up to 893 H.P.

America's Largest Builder of Diesel Engines



Flexible Homoflex Hose Takes Rough Handling!

Homoflex Hose offers a combination hard to beat for rugged use. It is engineered to provide maximum flexibility and light weight for easy handling—yet it's rugged and strong to take a beating when it has to be handled roughly on the job. That's why users specify Homoflex for use with air tools, or wherever heavy duty hose is required to handle air, water, and other fluids and gases.

"As flexible as a rope," workers on the job say, because Homoflex Hose coils and uncoils freely in any direction. This mandrel-made hose has no pre-set twist. It resists kinking and eliminates the internal strain that can lead to hose rupture. Specially designed super-strength cord braid is precision applied at just the right angle to permit the rubber tie-gum to completely penetrate and

bond the braided plies during vulcanization. This homogeneous inseparable tube-to-cover bond gives Homoflex its extreme flexibility, strength and long durability. Its uniform inside diameter makes easier the fitting of couplings and insures faster flow. Homoflex Hose cuts hose costs because it gets more work done and it lasts longer.

Ask the R/M representative about easy handling Homoflex Hose for your operations. He can also show you advantages of new burst resisting Super-Master BW Hose, the extra heavy duty braided wire inserted construction for high pressure air, water and steam service. General service or special duty, there's an R/M hose engineered for your operations... to give you "More Use per Dollar."

RM642



MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY
RAYBESTOS-MANHATTAN, INC.



Flat Belts



V-Belts



Conveyor Belt



Hose



Rail Covering



Tank Lining



Abrasive Wheels

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls



TWO TRACTORS, one pushing and one pulling, supply the motive power to operate the 54,000-lb ripper. Pushing tractor also mounts smaller Ateco ripper which it can put to work on the down grade or where the going is easy to help process the cut.

Big Ripper Takes 36-in. Bite

A HUGE RIPPER cuts a furrow 36 in. deep to break up a hard sandstone and shale formation for self loading by scrapers on a California highway job.

The 54,000-lb Peterson ripper costs about \$60 an hour to operate and requires two Cat D9's—one pulling and one pushing. McCammon-Wunderlich Co. and Wunderlich Contracting Co. brought the heavy ripper onto a 5-mi freeway job about 40 mi northeast of San Francisco to develop yardage quickly and continuously.

The \$6.9 million job includes 5,300,000 cu yd of roadway excavation. And it is under a tight time schedule with relatively heavy liquidated damages.

When it first arrived on the job, the ripper mounted two teeth spaced on 92-in. centers. But in operation this proved unsatisfactory; it broke the material into chunks too big for the scrapers to handle. And if the ripper got both teeth stuck, it might take four D9's to free it.

A single center-mouthed tooth was substituted, and results have been excellent. The Peterson ripper is designed as a 35,000-lb unit.



SINGLE TOOTH proved in operation to be most satisfactory. When the ripper mounted two teeth, it broke the hard material into chunks too large for scrapers to handle.

For the McCammon-Wunderlich job it has been beefed up to 54,000 lb by adding steel slabs above the tooth.

The ripper is 25½ ft long and has two 60-in. dia steel drum wheels. It is operated by the rear cable control on the tractor. It can mount as many as three teeth, a center tooth positioned for 36, 48, or 60-in. penetration and two outer teeth to cut 36 or 48 in. deep.

It was designed and built by Peterson Tractor & Equipment Co.

The \$60-an-hr operating cost includes equipment rental, operators, and replacement of shanks very often. The boot is replaced only when broken, and that's not ting edge of the shank—is replaced at least once an 8-hr shift, and, when the material is particularly hard, a boot may last only 4 hr.

Continued on page 108

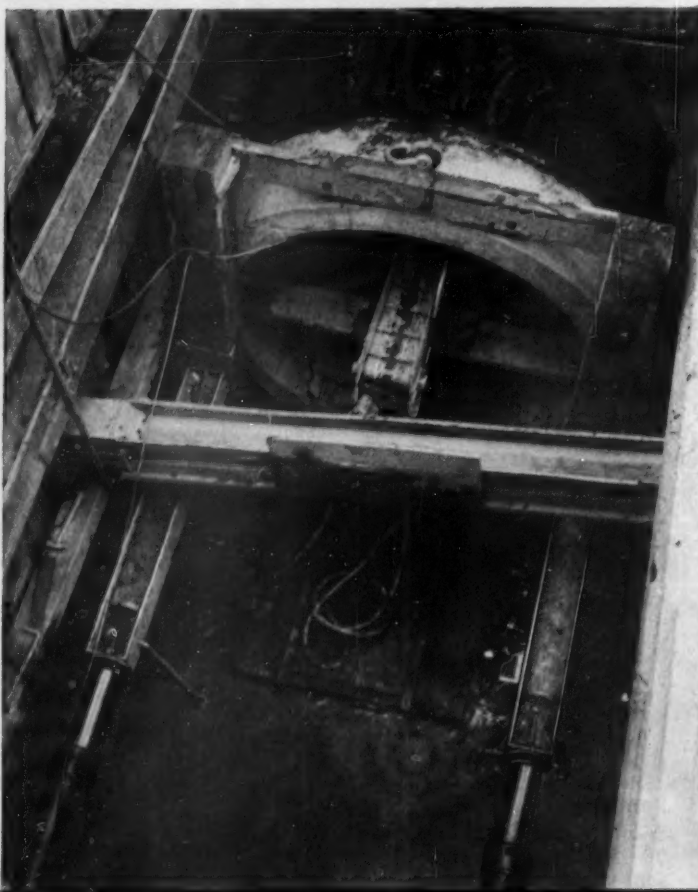
MUSCLES under the mainline!

Rodgers Hydraulic Jacks

push three 88 foot tiles under railroad without disrupting traffic

Two 200 Ton Rodgers Hydraulic Jacks were selected by W. J. Irwin & Sons, Inc., Tonawanda, N. Y. for driving three sewer pipes of 96" I. D. reinforced concrete tile 88' under the mainline of the New York Central Railroad. Part of a 2½ million dollar sewer contract on the Tonawanda West Side Drainage Project, the "push pipe" method was preferred because it permitted unrestricted use of the rail right-of-way overhead.

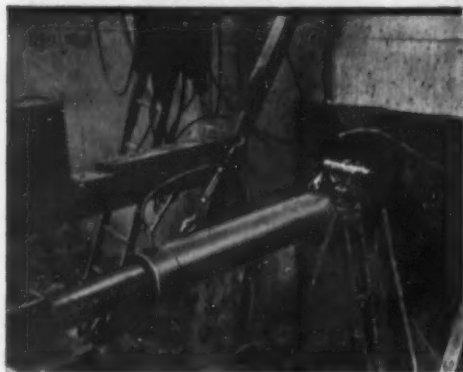
TIME: 34 DAYS—Actual jacking time consumed 34 days based on three-eight hour shifts a day. Each sewer took eleven 8-foot tile sections. The *First Line* required 14 days; the *Second Line* 11 days and the *Third* only 9 days.



↑ Steel rails cradle tile sections as twin Rodgers Jacking Cylinders press against the wooden jacking frame. Heavy grease on outside of tile cuts down friction—for easier sliding.

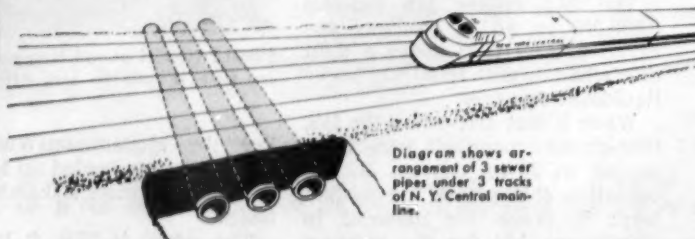
← Rear of excavation pit showing Hydraulic Jack against abutment wall. At this stage the ram is extended approximately 1/3 of the 48" ram travel.

ADVANTAGES OF HYDRAULIC JACKING—This job was handled at low cost and was unique due to the short time required for completion and the fact that rail service overhead continued uninterrupted throughout the tunneling project below. Entirely different from conventional tunneling, the "push pipe" method also provides greater safety to workers from cave-ins since they work inside the tile that is being driven.



JACKING PROCEDURE—A service pit 28' deep by 22' wide by 40' long was excavated to house the jacking equipment. A pair of 75 lb. steel rails placed on the concrete pit floor cradled the tile sections and acted as a guide for the jacking operation. Type of soil encountered in all three pipes was a mixture of heavy yellow and blue clay.

EQUIPMENT USED—Two 200 Ton Rodgers Hydraulic Jacks with 48" ram travel were powered by a Rodgers Model D2 electric driven hydraulic pump located at the top of the excavation pit. A valve panel located at the bottom of the pit permitted accurate control of the jacking operation.



If you'd like more details about this job, write for free copy of Bulletin 331.

Rodgers Hydraulic Inc.

7403 Walker St. • Minneapolis 26, Minnesota



STOP VARNISH!



Refill now with Sinclair SUPER TENOL® Motor Oil for top protection against harmful varnish in your Diesel engines.

No matter how rushed the job, SUPER TENOL protects your engine against the effects of high temperature, over-loading and *continuous stop-and-go*. Your Diesel stays on-the-job longer, with less wear . . . fewer repairs.

You get these benefits from Sinclair SUPER TENOL because it's specially made for *severe duty*. High viscosity index base oils, plus a heavy concentration of selected additives, have been combined to give you maximum protection against varnish, sludge, rust, and acid corrosion.

Refill now with Sinclair SUPER TENOL. Contact your local Sinclair Representative for further information or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation*

SINCLAIR SUPER TENOL



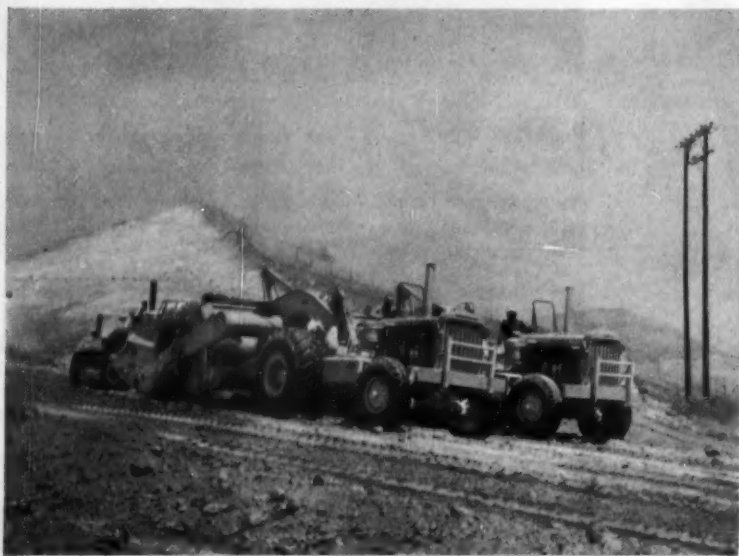
BIG CUT framed by reinforcing for an overpass structure is a 1,800,000 yd job. Total excavation on the 5-mi project amounts to 5,300,000 yd. Contractor has more than 60 pieces of earthmoving equipment at work on the job to meet a tight time schedule.

Also processing the cut are two D9's mounting Ateco (American Tractor and Equipment Co.) rippers on the rear. The Ateco rippers take a 20-in. bite. They work in areas where the material breaks easily, and they rework material broken by the big ripper.

In addition, the D9 that pushes the Peterson ripper mounts an Ateco ripper which it can put to work on the down grade or where the going is easy. On the up grade, all the power of both D9's is needed to push the big ripper.

With this ripping equipment and from 11 to 13 DW20 scrapers, McCammon-Wunderlich is moving 18,000 to 20,000 cu yd of material in an 8-hr shift.

For the California Division of Highways, Frank White is resident engineer. For the contractor, Floyd Helm is project manager, and Sam Martinelli, is project superintendent.



A STUNT on the job is pushloading two DW20's with a single D9 tractor. It's possible only on down grades of 15% or more, and it takes time to get the scrapers into position.

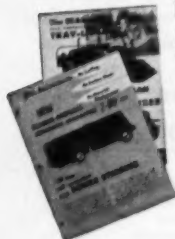


Shoulder to Shoulder — and on Shoulders, too **SEAMAN-ANDWALL PROVIDES HIGHER DENSITIES AT LOWER BUDGETS**

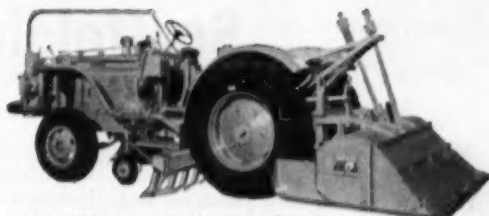
The SEAMAN-ANDWALL Pulvi-Mixer and the Self-Propelled 7-20 Ton Pneumatic Compactor are perfect partners in achieving high density stabilizations. Whether the job be of native soils, soil-cement, bituminous binder or chemical additives the Pulvi-Mixer provides a basic mix that rolls out to the tightest, highest load-bearing, weather resistant base or sub-base. When the Pulvi-Mixer completes its work the mix remains shaped to final grade and crown ready for immediate compaction. No finish blading is needed.

The Pneumatic Compactor . . . Adjustable to any weight between 7 and 20 tons, the Compactor retains the ideal placement and arrangement of coarse and fines which the Pulvi-Mixer established. Because power is applied to the front rolls only pressure is "straight down" so there is no displacement of materials, no scuffing and no surface shear.

Most maneuverable of all the heavyweights the COMPACTOR turns 180° on a 21 foot road. The operator sits sideways to forward travel, a position in which he has complete visibility of the rolling operation and best control for close-up work. Self-propelled, it is quickly moved from job to job under its own power.



Plan now to make the Pulvi-Mixer and the Compactor your primary, cost-cutting equipment. Send for these two Bulletins completely describing both units. Jot on a postcard "Bulletins TPS and PC" right now and mail it today.



The SEAMAN-ANDWALL PULVI-MIXER.
7 ft. mixing width, gasoline or diesel powered.



The SEAMAN-ANDWALL Self-Propelled
7-20 Ton Pneumatic Compactor.



STABILIZING THE WORLD

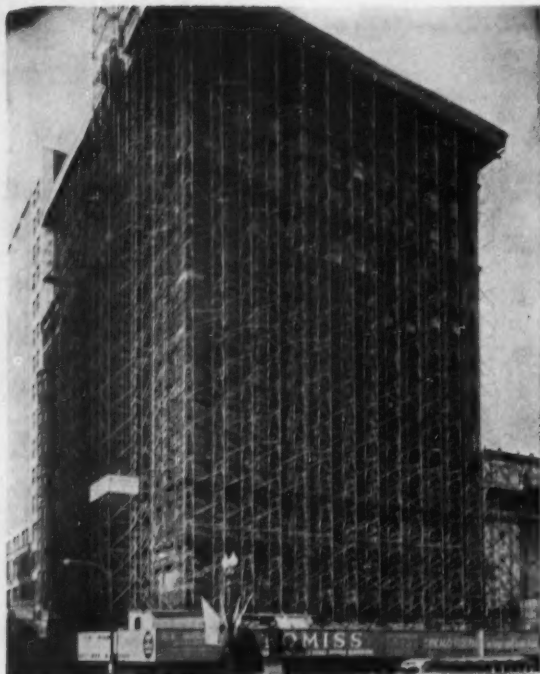
SEAMAN-ANDWALL

CORPORATION

Division of American-Marietta Company

Dept. No. R-210
MILWAUKEE 1, WISCONSIN

(Advertisement)



For safety and savings on large jobs or small, you should know . . .

How to Select Scaffolding and Shoring

MANY CONTRACTORS must be confused about conflicting claims regarding scaffolding purchase and rental values—and for good reason. They see a wide range of prices for what looks like the same thing. "Why not buy the cheaper stuff," they ask, "and pocket the difference." Facts show that the scaffolding with the lower price may actually cost much more than the equipment with the higher original price. The right way to select scaffolding and shoring is to consider all these points: **Lower Output**—Workmen move more slowly on scaffolding that is shaky or looks unsafe. Erection and

disassembly frequently take longer too, when joints and components are not precision-built to fit perfectly. **Accidents**—Even minor accidents due to scaffolding defects can cost more in work stoppage and injury claims than the entire cost of the scaffolding itself. It doesn't pay to pinch pennies when it can cost dollars and even lives.

The Manufacturer—Deal with an established scaffolding manufacturer whose equipment over the years has earned a reputation for safety and dependability. His long list of satisfied, safety-conscious customers is also a good indication of the quality of scaffolding he sells.

Other Benefits—Most jobs lend themselves to one type of scaffolding better than to any other type. The Patent Scaffolding Co., with the only really complete line of equipment, can recommend the type best suited to the project at hand. Through its nationwide network of branch warehouses and representatives, PS Co. can help meet emergencies by quickly shipping the right type of scaffolding. For those who prefer to rent scaffolding rather than buy it, completely reconditioned equipment—ready to be used without further maintenance—is always available through PS Co. offices.

To help you with your scaffolding methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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The **Euclid TC-12** gives you more work-ability than other Crawlers



The first really new tractor concept in years...
with **ALL** the performance features you've wanted

Euclid's Model TC-12 Twin-Power Crawler establishes an entirely new standard of tractor performance. It's built to deliver unequalled drawbar horsepower, easy operation and a smooth, steady flow of power to meet any job requirement. It provides easy accessibility of all major components and all lubrication, check and adjustment points are located for maximum convenience. Unitized assemblies permit service or removal without a major tear-down of other parts.

Powered by two 194 h.p. engines at rated speed, 365 h.p. is delivered to the power

train. Each of the tracks is driven independently through separate Torqmatic Drives giving the TC-12 faster, easier steering and greater drawbar pull at higher speed. There's no clutch—shifting from one of the three speed ranges to another is done under full power—top speed in forward or reverse is 8.3 mph.

Have your Euclid dealer give you all the facts on the TC-12—compare with your present big tractor equipment and you'll know why so many owners have proved that ***Euclids are your best investment.***

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



On the road - off the road...

THE IMPROVED TDA[®]

"3 FOR 1" LETTER SERIES

DRIVING AXLES

will do the job better than ever before!

Years of manufacturing experience—plus continuing field and laboratory research—have resulted in many engineering refinements and advanced features on the improved Timken[®] "3-FOR-1" Letter Series Driving Axles.

With Timken "3-FOR-1" driving axles, housings, axle shafts, differentials, bearings, brakes, hubs and drums—are completely interchangeable within each capacity range, and are standard production items, readily available. This means smaller replacement parts inventory—lower maintenance costs—and more time on the road.

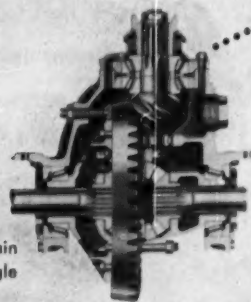
Whether your trucks are engaged in on-the-road or off-the-road delivery and hauling, specify the improved TDA "3-FOR-1" Letter Series Driving Axles for longer operating life—greater flexibility—lower-cost maintenance.

MAXIMUM INTERCHANGEABILITY!

You have your choice of 3 final drives, with each one interchangeable within its Letter Series—using the same housing, hubs, drums, brakes and axle shafts.

HYPOID SINGLE-REDUCTION!

A rugged single-speed power train that gives the maximum in single reduction performance.



Only on the improved Timken "3-for-1" Letter Series Driving Axles will you find these "YEARS AHEAD" features

Improved Hypoid Gears! Redesigned offset and increased Hypoid gear diameter provide longer gear life, smoother performance, and quieter operation — without sacrificing strength or ratio advantages.

Refined two-speed shift collar and cross shaft! Improved design gives positive locking action, virtually eliminates axle slipping out of gear — reduces gear wear and maintenance. Each set of teeth performs but one function — driving or locking.

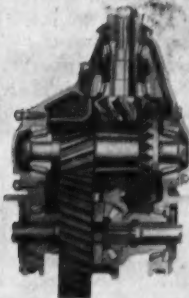
Improved torsion-flow axle shafts — plus new differential gears! More splines per shaft and increased root diameter give greater torsional strength, longer life.

Famous time-proved differential — rugged, reliable and smooth! Extra strong gear body and teeth, plus hot-forged trunnion, give long trouble-free operation even under roughest treatment.

Hot forged steel axle housing! The rectangular form of these high-carbon steel housings is the lightest, strongest shape of housing available today.

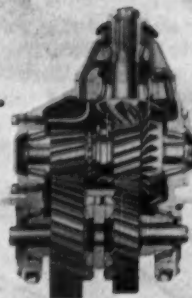
Improved "P" Series Power Brakes and "DH" Series Hydraulic Brakes! Available in a complete range of sizes, these advanced brakes offer the most dependable stopping power — lower maintenance cost — easy adjustment and longer service life.

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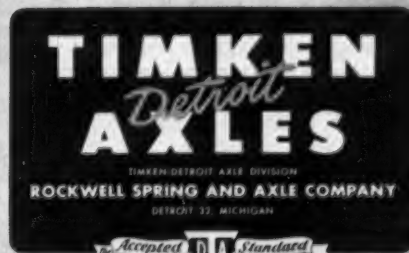
SINGLE-SPEED HYPOID-HELICAL DOUBLE-REDUCTION!

This advanced single-speed double-reduction final drive delivers consistently high performance either on or off the road.



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This final drive gives you the most advanced two-speed double-reduction gearing available. It's the ideal drive for all-around performance either on or off the road.



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WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSES AND TRAILERS



BARGE-MOUNTED CRANE lowers 32-ft pipe sections in trench blasted out of coral reef. Meanwhile, truck crane on trestle lays 16-ft sections into sheeted trench at shore line. To protect against waves, first 700 ft of mile-long outfall is encased in concrete.

Ocean Outfall Slits Coral Reefs

AN UNPREDICTABLE PIECE of Atlantic Ocean off the east coast of Florida presents interesting problems to the builders of a long sewer outfall. Besides the difficulty of cutting through two underwater ridges of hard coral, they face the constant danger of sudden storms, the hazards of deep-sea diving, and unique problems of laying pipe through surf.

Powell Bros. Construction Co. of Ft. Lauderdale, Fla., has the contract to lay a 30-in. concrete pipeline into the sea at Palm Beach. Their \$800,000 job for the Town of Palm Beach begins 100 ft back of high-tide mark on the shore line and extends 6,000 ft to the Gulf Stream. The large volume of water in this ocean river moving northward at about four knots per hr will dispose of sewage without any danger of pollution.

Two Operations

The job is divided into two sections. The first 700 ft of pipe is laid from a trestle, and the remaining 5,300 ft is placed with floating equipment. A trestle from the shore line is required to provide a roadway for the rigs that handle difficult pipelaying in the surf and the turbulent waters beyond. To prevent wave action from disturbing the pipeline, specifications require that the first 700 ft of pipe be laid in a sheeted trench and then encased with concrete.

Timber Trestle

Powell's first job was to build a 700-ft timber trestle into the ocean alongside the outfall line. They decided on four-pile bents 15 ft apart spanned by eight 6x12 stringers and decked with 3x8 rough tim-

bers. A curb on each side was built with 4x8's.

The trestle went in quickly. Wood piles 36 ft long were driven through a templet hung and cantilevered from each previously driven bent. The lightweight steel-frame templet positioned piles, spaced the bents, and served as two-level scaffold for men placing caps and diagonal bracing. After each bent was completed, a Lorain truck-crane placed stringers, laid deck, drove the next bent, and then moved the templet ahead.

When a few hundred feet of trestle was completed, Powell began laying pipe. It was slow going, especially at the shore line. The beach elevation averaged plus 10, and the pipe was at minus 7. This depth of wet sand was too much for sheet piling to hold back when

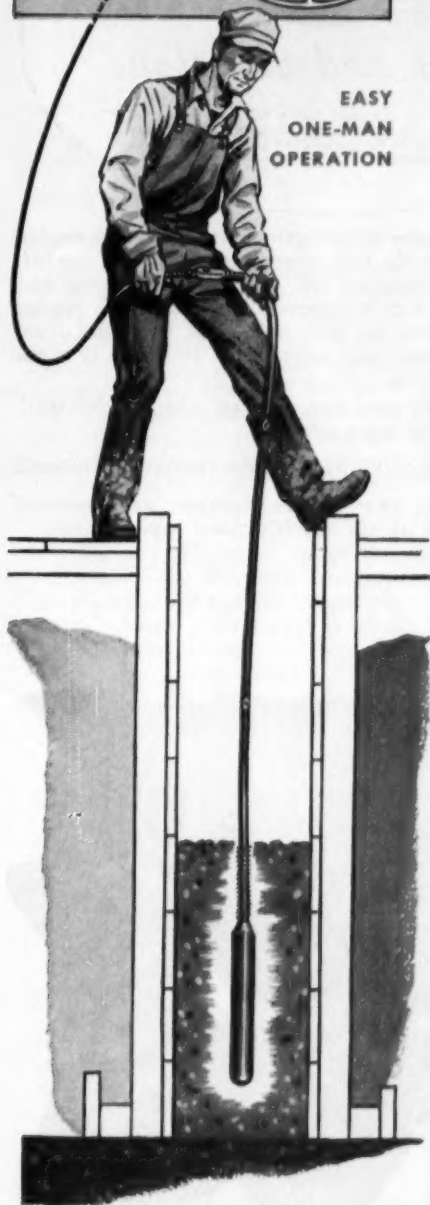
Continued on page 117

25% more power! Lower vibrating cost!

Can be plugged into any standard 115-volt DC or 60-cycle AC outlet or portable generator plant.



**EASY
ONE-MAN
OPERATION**



New Thor Motor-in-head

UNIVERSAL ELECTRIC

Concrete Vibrator

Better Vibration—Greater power and higher speed permit better penetration and compaction in stiffer mixes.

A Thor First—Exclusive new vibrating mechanism is housed in a special abrasion-resisting one-piece, heavy-wall housing. Bearing loads practically eliminated. Longer bearing life and increased operating efficiency are assured. No welded construction.

15,000 R.P.M. Thor Motor—Specially designed for concrete vibrating, triple-insulated against heat and heavy loads. Thermal controls automatically shut off current in case of excess heat or overload.

Reduce Costly Down Time!—Thor's motor-in-head construction does away with heavy, cumbersome, high-maintenance flexible shafts—permits easy one-man operation.

Streamlined Submersible Switch—Can't catch on reinforcing metal because it's round, smooth, and tapered to hose diameter, concrete-proof and moisture-proof. Special operating hose is neoprene-covered and neoprene-lined to resist oil, grease, and gasoline. Flexible, easy to maneuver on forms.



Model V2-10 has 10-ft. hose and switch.

Model V2-20 has 20-ft. hose and switch.

Model V2-210 has 10-ft. hose on each end of switch.

All models include 25-ft. 3-conductor electric cable. Ask your Thor distributor for a free on-the-job demonstration. Thor Power Tool Co., Aurora, Ill.

THOR POWER TOOL COMPANY

Branches in all principal cities





save

\$40 per month

on gas and oil alone

Careful records by operators for a full year of tough schedules prove that the Smith Integral[®] saves more than \$40 per month on gas and oil alone compared to separate engine drives.

It's the "engine loafing" that hikes maintenance costs

With a separate engine drive, high maintenance results from *loafing* the truck mixer engine—not from working it to death.

The Integral NEVER LOAFs

In the Integral, the truck engine always operates at efficient speeds. Carbon buildup is eliminated.

There is plenty of horsepower from the truck engine alone because *the only times extra power is needed, the truck is standing still*. This is for charging and discharging. Full horsepower from the truck engine is thus available for both operations. Once the drum starts revolving, only about 5 to 10% HP is taken from the engine.

If you don't need two engines, why pay for two? *One* is actually more efficient.

Write for full details about the cost-saving Integral.

Since 1900, the pioneer designer and foremost manufacturer of the world's finest mixers.



SMITH

integral^{*}

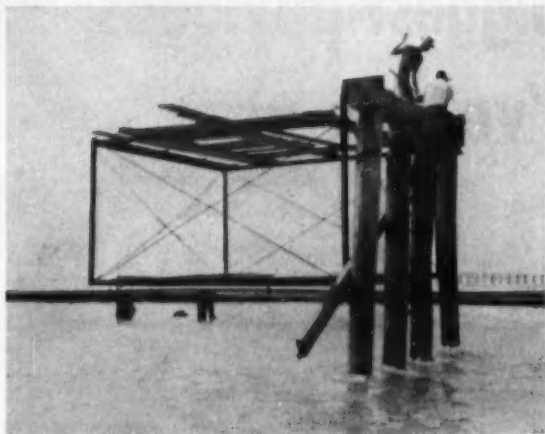
ONE FRAME FOR BOTH TRUCK AND MIXER

ONE ENGINE FOR BOTH

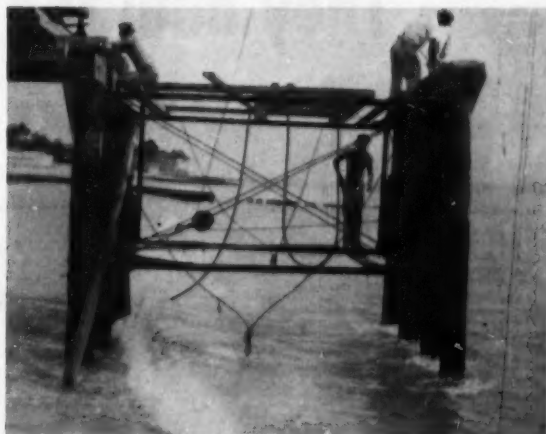
*TRADE MARK

THE T. L. SMITH COMPANY, Milwaukee 45, Wisconsin; Lufkin, Texas

Affiliated with Essick Manufacturing Company, Los Angeles, Calif.



TEMPLER IS HUNG on pile cap and cantilevered forward to help locate and position timber piles for next bent on trestle.

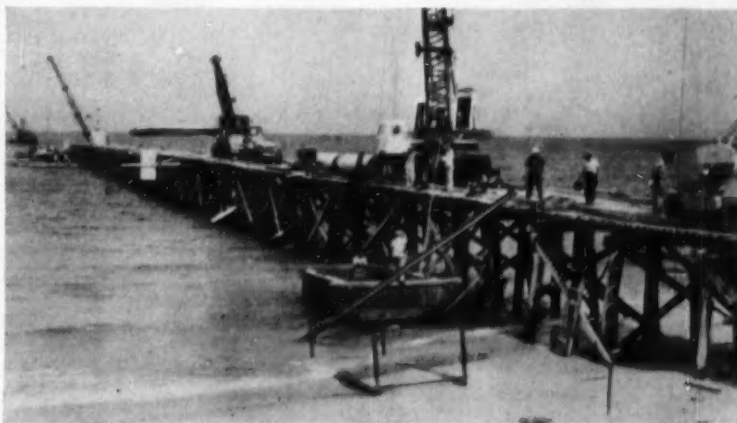


PLANKING across steel members converts templet into scaffold for workmen who place pile caps and diagonal bent bracing.

the 6-ft wide trench was excavated.

Powell's answer was a heavy steel rectangular box. When two lines of sheets were driven for one 16-ft length of pipe, the box was placed around the area and sunk with jets. With the box serving as a cofferdam, the trench was excavated between the two lines of sheets, and a length of pipe was placed inside and encased with concrete.

The box then was pulled out, the two lines of sheets were extended, and the operation repeated. This method was continued until the pipeline passed into the surf. Here, the trench would fill with water, eliminating any difference in head and the need for the box.



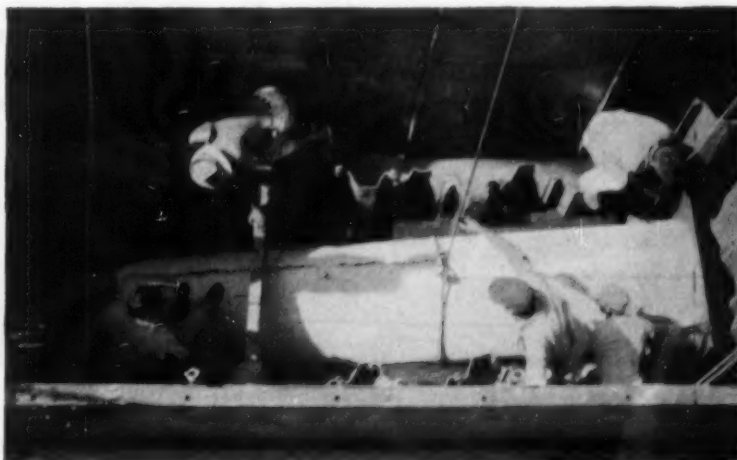
TIMBER TRESTRLE is extended into ocean while truck cranes on top begin laying pipe. At shore line, submerged steel box serves as cofferdam for sheeted pipe trench.

Driving Sheet Piling

Sheet piling was driven through a steel templet 40 ft long. Each time the two lines of sheets were ready to be extended, a truck-crane on the trestle moved ahead, drove two pin piles, and placed a cap on top. The templet was then advanced. Its rear end was placed on the leading sheet piles and its front end on the two pin piles.

Steel M115 sheets 27 ft long were first set up within the templet guides and driven by a combination of driving and jetting. Powell attached two jet pipes to opposite sides of a drop hammer and projected the pipes below the base of the hammer. When driving, jet pipes straddled a sheet pile, loosening the sand underneath as the hammer drove from above.

Continued on page 120



PIPE SECTION 16 ft long is lowered into trench between two lines of M115 sheet piling. Water-tight joint is made by bolting bell-and-spigot ends together over rubber gasket.

"They haul the biggest payloads of any trucks I've ever used"

—says Angelo Cataldo, Cataldo Construction, Revere, Mass.,
about his 15 new GMC W674 tandem dumps



HAULING 20 TONS OF FILL AT A CLIP, these brand-new GMC W674 tandems are speeding work on the new Revere Beach Parkway overpass in Everett, Mass. And they're handling these extra-size loads without overloading or spillage problems. The trucks Cataldo previously used on this job had had almost continuous trouble on both these counts.

"GMC WAS THE ONE MAKER WHO DESIGNED JUST THE TRUCK I WANTED," says Cataldo. "It carries the maximum weight allowed in Massachusetts. It meets all the State specs. In fact, it's made to order for just the kind of problems we have in the Boston area."



HEAVY TRAFFIC—NARROW BACK ROADS—RUGGED OFF-THE-ROAD CONDITIONS are all included in the 35-mile round trip between pit and dumping point. Each of the Cataldo GMC W674's—powered by a rugged 225-h.p. engine—makes at least 6 round trips a day. Other timesaving GMC haulers are available all the way up to 63,000 GVW-90,000 GCW.

GMC TRUCK & COACH
A General Motors Division

Why do
highway designers
and
builders

GO

for

DURAPLASTIC*?



WORKABLE, PLASTIC concrete mixes made with Atlas Duraplastic Cement helped speed construction on New York State Highway, Fort Plain, N. Y.

because this concrete looks better, lasts longer!

When paving must be placed fast, highway designers and builders prefer Atlas Duraplastic cement because it makes a more plastic, more cohesive concrete that dumps, spreads and finishes easily. Also, bleeding and segregation are minimized, permitting finishing closer to the paver and earlier curing.

Besides improving workability, Atlas Duraplastic Air-Entraining Portland Cement gives concrete greater durability . . . fortifies it against freezing-thawing weather and scaling caused by de-icing salts.

YET DURAPLASTIC COSTS NO MORE than regular cement—requires no unusual changes in procedure.

Complies with ASTM and Federal Specifications.
For descriptive booklet, write:

UNIVERSAL ATLAS CEMENT COMPANY

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100 PARK AVENUE, NEW YORK 17, N. Y.

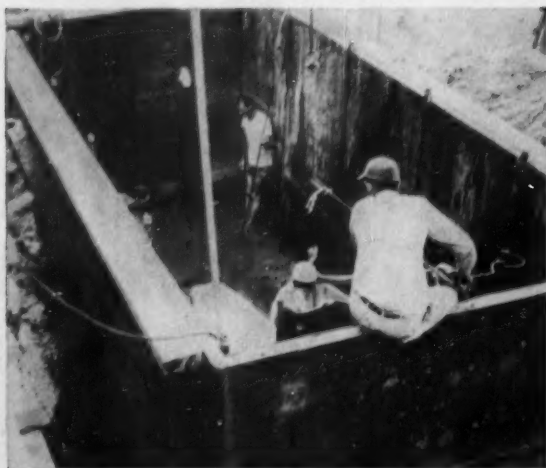
*"DURAPLASTIC" is the registered trade-mark of the Air-Entraining Portland Cement manufactured by Universal Atlas Cement Company.

AIR-ENTRAINING PORTLAND
Atlas® Duraplastic Cement

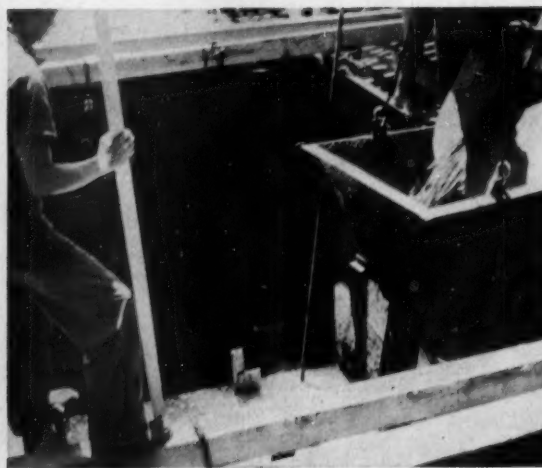
MAKES BETTER CONCRETE AT NO EXTRA COST

OFFICES: Albany • Birmingham • Boston • Chicago • Dayton • Kansas City • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco

United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station.



STEEL BOX serving as temporary cofferdam on beach resists pressure of wet sand. Note jet pipes attached to walls of box.



TREMIE CONCRETE is built up under and around pipe. Sling, adjusted by come-a-long, supports free end of 16-ft section.

A lorain truck crane drove all sheets and moved the templet. Not far behind, a Gar-Wood truck crane excavated the trench, advanced bracing, laid pipe, and encased them in concrete.

The 6-ft wide sheeted trench was cross-braced at the top every 17 ft with a steel strut framed into

12-in. steel walers. Inside the trench, excavation was carried to a depth of 14 in. below the pipe grade to provide space for the concrete encasement.

Pipe sections 16 ft long were lowered into the trench and suspended in slings. To join two sections, divers inserted two bolts on

one section into matching lugs on the other and turned them up with a ratchet-type wrench. This pulled the steel bell-and-spigot ends tightly together over a rubber gasket. Come-a-longs on the slings adjusted the grade of the pipe, and then tremie concrete was built up inside the trench. The completed encasement was a minimum of 12 in. thick around the pipe and 14 in. underneath. A wood bulkhead left about one foot of the front end exposed so that it could be joined with the next section. Behind the pipe-laying spread, a diver cut off sheets a minimum of 3 ft below ocean bottom to prevent them from becoming hazards.

It was slow going. Generally, only one pipe a day was laid and encased. And it took a lot of planning to get that much. A big problem was coordinating operations on the trestle. Often, three rigs were working at once—a truck crane extending the trestle, another driving sheet piles, and a third laying and encasing pipe. All three units had to be supplied, but traffic on the trestle was strictly one way at a time. Powell's best solution was to load up materials at the two forward rigs each night to reduce the number of interruptions of the pipe-laying spread. The plan worked well most of the time.

Deep Water Work

To speed the job, Powell laid shallow and deep pipe at the same time. While one crew worked from the trestle, another crew, with a

Continued on page 125



TWO JET PIPES projecting below drop hammer straddle sheet pile to loosen underlying material, as hammer drives from above. Steel templet resting on H-piles guides sheets.

MORE YARDAGE on any job



more yards per load... more loads per hour

DIG MORE Powerful pry-out action and 40° bucket tip-back at ground level get full bucket loads with less spillage loss. Power-transfer differentials provide sure-footed traction for digging power.

CARRY MORE Bucket carry position is close and low for maximum stability. Hydraulic system shock absorber cushions loaded bucket—smooths the ride—permits higher carrying speeds with less spillage.

DELIVER MORE Since you get MORE to begin with and keep MORE while traveling at higher speeds... with less spillage in both instances... the result—you deliver more yards per load and more loads per hour.

Now you have a choice of three sizes of 4-wheel-drive "PAYLOADER" tractor-shovels, each with *all* the more-productive features pioneered and proven by The Frank G. Hough Co.

They have power-transfer differentials—an exclusive "PAYLOADER" tractor-shovel feature that maintains effective traction on mud, gravel, ice and snow.

They have "no-stop" power-shift transmissions and torque converters... planetary final drives... power-steering and 4-wheel power brakes.

They have the exclusive bucket motion with 40° bucket tip-back at ground level and powerful pry-out action.

For proof of their superior performance and greater productive capacity on *your* job, ask your "PAYLOADER" distributor for a demonstration.

THE FRANK G. HOUGH CO.
706 Sunnyside Ave., Libertyville, Ill.

Send full data on 4-wheel-drive "PAYLOADER" tractor-shovels.

- ☐ model HO 2 1/4 yd. payload; 1 1/2 yd. struck
☐ model HH 1 1/2 yd. payload; 1 1/2 yd. struck
☐ model HU 1 1/2 yd. payload; 1 yd. struck

NAME _____
TITLE _____
COMPANY _____
STREET _____
CITY _____
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THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



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**why Liberty Mutual has been the
number 1 writer of compensation insurance
for 20 straight years**

...and why Liberty can save you real money

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2 Engineering know-how: When you work with Liberty, you work with a team of Loss Prevention engineers who know your business and talk your language. Through *advance analysis* they help you plan control of potential hazards before each of your projects begins. They follow-through every step of the way, working full-time on the project when necessary. They have perfected techniques for keeping men safe, controlling damage due to blasting, improving operating methods in all types of construction projects.

3 Saving you money: Your local Liberty Mutual office can show you an up-to-date list of over 100 contractors whose insurance costs have gone down since they became Liberty policyholders. In one case there was a change of 76% . . . in another, 70% . . . and there was a 50% or better change in the insurance rates of 14 other contractors. Superior loss prevention and claims service is the principal reason Liberty consistently saves money for contractors.

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5 Research: Liberty Mutual has its own fully-staffed and equipped laboratory in which it studies overall construction safety problems as well as the spe-

cific difficulties faced by individual contractors. Out of this have come many ideas for safer operating methods, new and improved techniques to reduce tough problems.

6 Around the clock claims service: On large projects, Liberty Mutual has full-time claimsmen right on the job. Experienced, company trained claimsmen assure fast, fair handling of every claim. If there's an accident on your job, there'll be a Liberty claimsmen swinging into action fast.

7 Large medical staff: Liberty Mutual's unique medical program has drawn praise from medical authorities everywhere. Liberty has its own team of specialists available to check the diagnosis and treatment of all serious injuries. In addition, Liberty has two famous rehabilitation centers where badly injured workers learn to be useful, self-supporting citizens once again. Liberty also assists in setting up "preventive" medical programs for each large project.

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9 Direct dealing: When you're a Liberty policyholder, you deal only with salaried employees of the company. Their interests are yours. No brokers or middlemen. This can save you money, assure you of the best insurance advice.

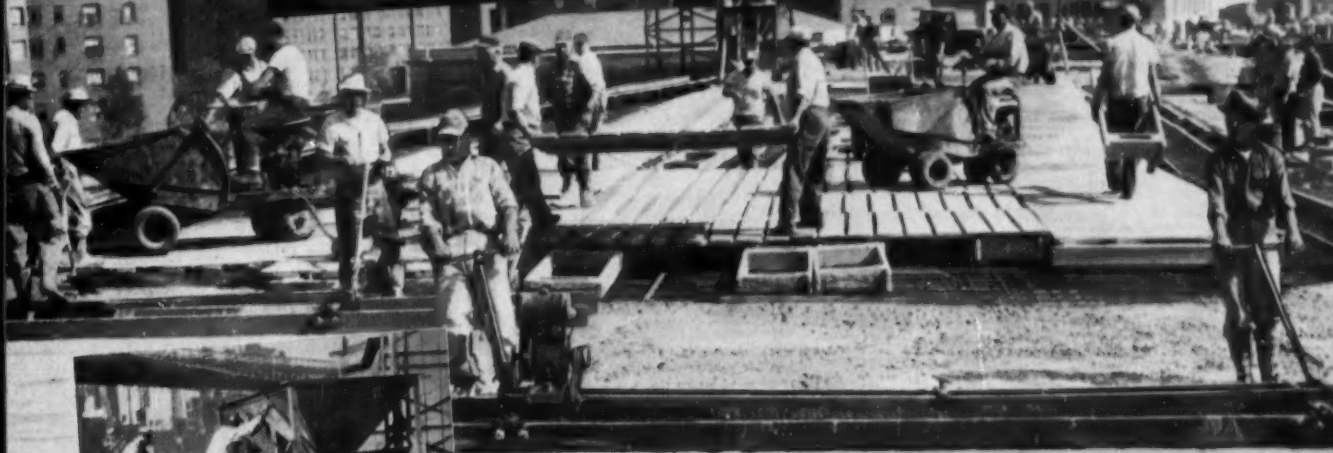
10 Ability to follow your operations: Liberty has branch offices in 146 cities at your service. Get in touch with the office nearest you, and ask just one question: "Can you save me money on my insurance?" If they can — they'll *prove* it to you!

LIBERTY MUTUAL

The Company that stands by you

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ELEVATED HIGHWAY JOB...



Concrete is discharged from elevator into twin hopper where Whiteman Power Buggies load up.



Power Buggies speed along runways at fast clip, handling average 10 yd. per hour on 300 ft. haul.



Highway deck slab is spread and finished to a perfect level with Whiteman Screeding Machines.

Whiteman POWER BUGGIES & 2 SCREEDING MACHINES HANDLED

215 YARDS OF CONCRETE PER DAY!

A tough assignment ... delivering and pouring concrete for a highway 23 to 31 feet above heavy traffic. Yet it was done smoothly, efficiently on Manhattan's East River waterfront through the use of Whiteman Power Buggies. Operating over portable wood runways, four Power Buggies handled from 180 to 250 cu. yds. of concrete in a 5 to 6 hour period, averaging better than 40 yds. per hour on an average 300 foot haul.

Spreading and finishing concrete for the highway deck was done in record time by two Whiteman Screeding Machines* covering a 37½ ft. wide slab pour ... saving time, compacting the slab, bringing moisture to the surface and screeding to a perfect level.

Whatever your problems in placing and finishing concrete, call your Whiteman distributor for helpful information.

*Approved by New York State Highway Engineers

General Contractor: Follenberg Pile
Co. Subcontractor for concrete
deck: Build Contracting Corp.

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THE LEADER IN CONCRETE EQUIPMENT

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Please send prices, literature and name of distributor for ☐ Screeding Machines, ☐ Power Buggy ☐ Floating Finishing Machines.

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City _____ Zone _____ State _____

What makes this hauler a driver's dream?



It's the Allison FourSpeed TORQMATIC DRIVE—a torque converter, transmission and retarder in one compact unit.

And this headline-making drive does more than fulfill a driver's dream as he puts this International Harvester 24-ton Model 95 Payhauler through its paces.

It speeds trips and job-cycle times. There's no break in the power flow as the driver flicks a lever to switch speed ranges with terrain changes. There's no clutch-pedal pushing, no gearshift-guesswork.

Allison TORQMATIC DRIVE holds maintenance and repair

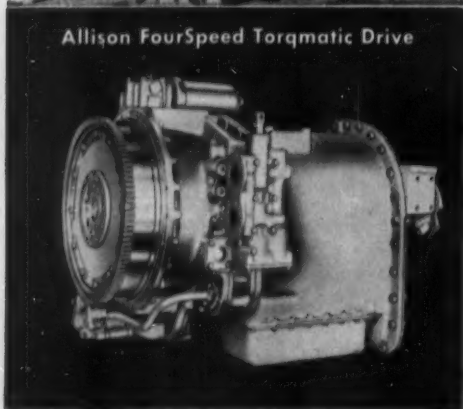
costs down to the minimum. The TORQMATIC converter absorbs shock loads, prevents harmful engine lugging and stalling.

Another exclusive feature of this TORQMATIC DRIVE greatly extends service-brake life, makes driving safer, too. It is the built-in hydraulic retarder which gives this hefty Payhauler a second braking system that saves regular service brakes for full stops or snubbing on curves.

Want to know more about this great new Allison Model CBT-5640 FourSpeed TORQMATIC DRIVE? Write Allison Division of General Motors, Box 894T, Indianapolis 6, Indiana.



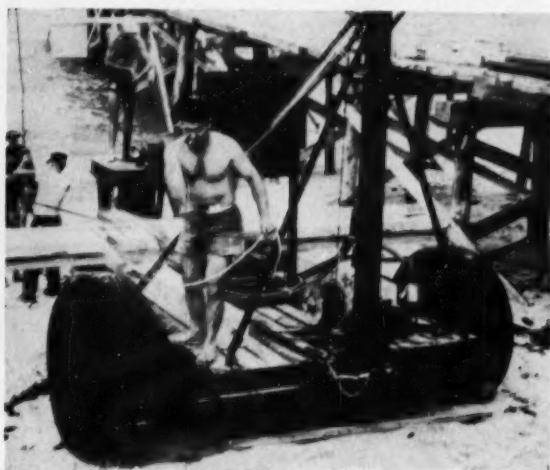
Allison FourSpeed Torqmatic Drive



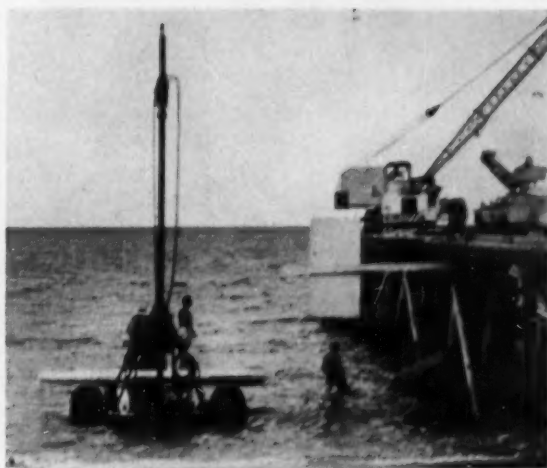
Allison



TORQMATIC DRIVES



AIRPLANE TIRES filled with water support underwater wagon drill. Winches, drill, and feed are compressed-air powered.



UNDERWATER WAGON DRILL is towed into surf and out on ocean floor to coral reef for drilling blast holes for pipe trench.

Underwater Drill Rides Coral Reef

fleet of floating rigs, started 700 ft out from shore and laid pipe in deep water. This crew had not progress far before it ran into a reef of hard coral 1,000 ft wide. Clamshells were useless; the coral had to be drilled and blasted. The ocean was too turbulent for a drill barge so Powell built an underwater wagon drill. It was mounted on two large airplane tires and had one small tire in front to make it maneuver easily like a tricycle.

Underwater, the drill was operated by two divers. They drilled 3-in. holes about 15 ft deep. The pattern called for a series of holes 6 ft apart along the centerline of trench. Maximum allowable charge, however, was only 20 lb. With 5-lb sticks, this restricted the maximum number of holes per shot to four.

To keep holes on line, divers followed a 3/16-in. cable stretched along the ocean floor as a guide. Divers moved the drill with an air winch that pulled on an anchor buried ahead. Periodically, they carried the anchors ahead by hand and sunk them along the cable.

Servicing the drill from above was a diver boat equipped with two compressors—a 315 cfm for operating the drill and a 60 cfm for divers.

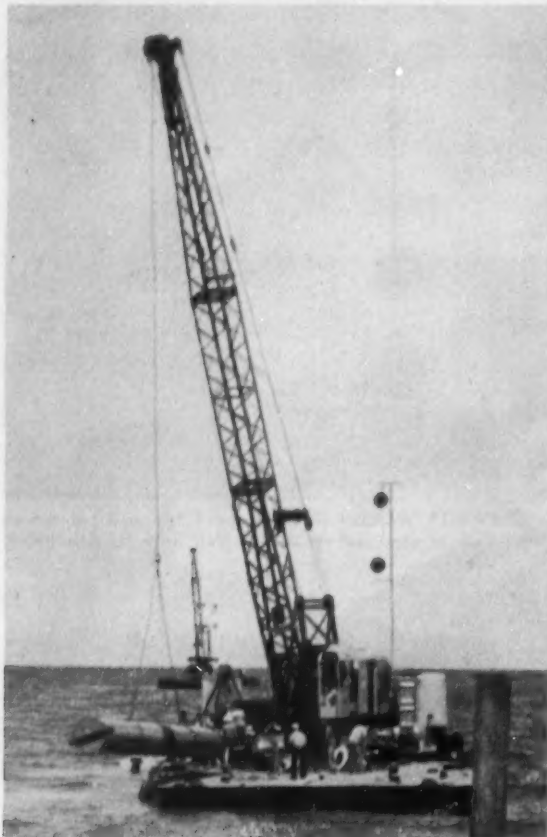
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PLYWOOD BULKHEADS bolted to pipe ends allow 32-ft long sections to be floated to placing rig. Circular block inside bulkhead makes watertight joint with rubber gasket.



FLOATING PIPE towed from shore is hoisted aboard barge and prepared for laying. Converted Navy LCM landing craft does most of towing. Water is 70 ft deep.



LORAIN crawler crane operating on barge lifts pipe from sea. Beyond, contractor-made whirler excavates with clamshell.



TAGLINES attached to joint-connecting lugs control placing of pipe section in deep trench. Divers bolt pipes together.

Blasted coral was excavated by clamshell and cast to one side. Handling the bucket was a 25-ton floating whirler built by Powell. Mounted on a 36x110-ft barge, the rig was operated by a 4-drum Clyde hoist powered by a General Motors diesel engine. Five single-drum hoists powered by Ford gasoline engines operated anchor lines.

Following behind was a pipe-laying spread consisting primarily of a Lorain crawler crane on a barge. No supply barges were required because Powell developed a method of capping the ends of pipe sections and floating them to the rig. On shore, simple plywood bulkheads were placed over each end of a pipe and pulled tight by bolts that fitted into the two standard connecting lugs on the outside. A circular block inside each bulkhead made a watertight joint with the rubber gasket, and the pipe was seaworthy.

Small tugs towed the floating

sections to the barge where they were lifted from the water by the crane. Bulkheads were removed, and the pipe was ready to be laid. With a two-point sling pickup at quarter points, the crane lowered 32-ft sections in water up to 70 ft deep. Divers gave signals until a section was lowered on to concrete blocks laid in the bottom of the trench at the pipe's quarter points. The joint was made by the conventional method of bolting. To prevent any side movement, divers drove wedges between the pipe and concrete blocks. And later, the trench was backfilled.

Despite the hazards of deep water, Powell often laid five sections a day. But it required a lot of diving. At 70 ft, divers could spend only 1½ hr under water. And much of that time was consumed going down and coming up. Generally, two divers worked, while four rested on a boat. Because of the depth, a decompression chamber was mounted on the

boat to handle any emergencies.

By the end of this summer, Powell had completed about 4,000 ft of the job. Then bad weather hit unexpectedly. Although the contractor was in constant touch with the weather bureau, his crews were unable to pull all their rigs to safety before a severe storm struck. Unfortunately, the 25-ton derrick boat broke her tow lines and went aground on the beach. The rig is now being rebuilt, and will be ready when the fleet returns next spring to complete the job. The only major change of plans will be the method of excavating the trench in the second reef. The material is somewhat softer and will submit easily to an Owen 1¼-yd round-nose clamshell.

Burgess Rand is superintendent for Powell Bros., Inc. Norman Schmid is town engineer, and Jake Boyd is town manager of Palm Beach. Malcolm Pirnie Engineers is the consultant.



EIMCO 105 -- MORE POWER FOR MORE WORK

Eimco 105 Tractor-Excavators are balanced to give maximum work efficiency in every phase of digging and loading. Compare these figures—(A) 39,200 pounds of digging force at the bucket lip as the 105 moves into the rock pile; (B) 39,200

pounds of lifting capacity for breakout power.

This power gives the operator the same potential in productive capacity as he would have if you bought him a boom type shovel costing three to four times as much.

How does Eimco design a small (1½ yard) Tractor-Excavator to out-produce every other machine in its price range?

The answer to this is Eimco's unique Tractor design which provides better balance, lower center of gravity and delivers full engine horsepower to the bucket at all times.

Eimco also makes it easier to operate the 105 Tractor-Excavator. The operator sits up front where he can see what he is doing. Two small handles, easily held in one hand, control all movements of the

Tractor. The operator does more work with less effort, stays efficient the entire shift.

Other firsts in the Eimco 105 Tractor-Excavator include (1) independent track control so that one track can be run forward while the other turns reverse; (2) separate final drives for each track; (3) full track oscillation on the tractor when equipped with loading or excavating attachment; (4) elimination of master clutch and drag-track steering; (5) Unidrive transmission in which gearing always rotates in the same direction; (6) all alloy steel construction; (7) clutches that never need adjustment — and many other exclusive features.

See these completely new tractors as Bulldozers, Excavators or Loaders working near you. Write for complete information.



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B-222

Introducing a tough "Lightweight"



NEW Amsco® Manganese Steel LIGHTWEIGHT DIPPER

Rugged $\frac{3}{4}$ yd. dipper, made of the "toughest steel known," actually work-hardens under impact

Those big, tough Amsco Dippers now have a smaller brother. With this new, rugged, lightweight dipper, small shovel operators can enjoy the combined advantages of long-wearing manganese steel and proved Amsco design features, such as:

- One-piece manganese steel back castings
- Arch formed by complete box section for maximum strength
- Teeth are set for clean, fast digging
- Interior is designed for rapid dumping
- Lugs for handle, back, and braces are cast integral with back—for extra strength
- 25% lighter than standard Amsco $\frac{3}{4}$ yd. dipper, per-

mitting use on light-duty shovels and allowing their developed power to be more fully utilized

- Curved door in back, for full-capacity loading with each pass

Ask your shovel manufacturer for full information—or write us direct for descriptive literature.

"Vital Statistics" on this new lightweight champ

Height of front over teeth.....	4 ft. $\frac{3}{8}$ in.
Height of back.....	2 ft. 7 in.
Opening at top.....	2 ft. 5 in.
Opening at bottom.....	2 ft. 7 in.
Approximate weight.....	1550 lbs.



AMSCO

American Manganese Steel Division • Chicago Heights, Ill.
OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DELAWARE, OAKLAND, ST. LOUIS, JOLIETTE, QUEBEC



Lick steep grades, spongy footing

build road-approach to Arkansas levee

Pulling 6½-yard loads uphill, over soft ground, 2 D Tournapulls with sideboards helped rebuild 2½ miles of Arkansas State Highway 1—from Pendleton north to the Arkansas River levee. Graves Brothers Co., of Pine Bluff, Arkansas, handled the dirtmoving for Linwood Smith, prime contractor to State Highway Dept.

Because of the length of haul and poor footing, Graves Bros. sent the 2 "D's" to build an inclined approach where Route 1 joins the levee. Short haul cut-and-fill work, in generally level terrain and sandy ground, was handled by a crawler-drawn scraper. Two graders (one an Adams 550) spread fill and regraded the 2½-mile stretch of road.

Up and down the levee-side

Tournapulls loaded in a bottom-land ditch at the foot of the levee. Pushed by a crawler-dozer, 138 hp "D's" heaped 6½ yards of sandy clay in an average 54 seconds, in 50 to 75 feet. After a 675' uphill haul to the top of the levee, dirt was spread over 75 feet in 20 seconds. Tournapull's big low-pressure tires and exclusive power-transfer differential pulled loads through soft, slippery spots without loss of time or yardage. Downhill return to the borrow completed a 1500' cycle.

"Handles fine on slopes"

Superintendent W. A. Cassity is well pleased with the way his "D's" worked the steep, Route 1 job. His records show the two rigs were consistently moving 185 to 200 loads in ten 54-minute hours. Cassity says, "These LeTourneau-Westinghouse D Tournapulls are good all-around dirtmoving machines."

Says operator H. R. Stephens, "I like Model D's 30 mph speed, and the maneuverability of electric steering. Rig is easy to handle, simple to maintain. It handles fine on steep slopes because it's powerful, low, and well-balanced."

157 miles in 6½ hours

According to Supt. Cassity, the "D's" averaged better than 25 mph in traveling 157 miles over state roads, from Parkin to the job at Pendleton, Arkansas. On this trip, one Tournapull towed a trailer tool-house, the other an extra 4-wheel trailing scraper.

Tournapull versatility

You'll find D Tournapull completely fills your needs for a fast, flexible, self-propelled scraper. It works economically on big jobs and small, over long or short hauls. In addition to

general earthmoving work, "D" cuts ditches, shapes back-slopes, fine-grades, builds road shoulders, spreads gravel, handles clean-up. With optional blades or other attachments, rig dozes, back-fills around buildings and culverts, plows snow, and does a host of other handyman chores.

Improved "D" moves more dirt

To help you move more dirt, faster, the improved D Tournapull now has increased capacity of 9 yds. heaped, 8' width, and permissible axle-load ... requires no special road permit. Call or write for details.



D Tournapull with sideboards spreads 6½-yard load of sandy clay on roadway approach, as second scraper returns to bottom-land loading area out of camera range.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-1037-H-b



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



Anchor Bolts Keep Rock Under Control On Route 9W Near Kingston, N. Y.

Here's a closeup of some of the rock anchor bolts installed recently along a section of Route 9W, north of Kingston, by the Department of Public Works of the State of New York. The rock in this formation, long a potential source of danger to motorists, is now locked in place by means of Bethlehem wedge-type anchor bolts, in lengths of 4 ft and 6 ft, plus 6 in. x 6 in. flat anchor plates.

Bethlehem Rock Anchor Bolts are ideal for keeping banks of rock under control because of the effective way they bolt together stratified slabs of rock, or anchor individual boulders to bedrock.

SLOTTED AND HEADED ANCHOR BOLTS

Bethlehem Rock Anchor Bolts are made in two types: a 1-in.-diam slotted bolt, used with a steel wedge, and a $\frac{3}{4}$ -in.-diam headed bolt, used with an expansion shell. Each type can be counted on to provide positive locking action in the hole.

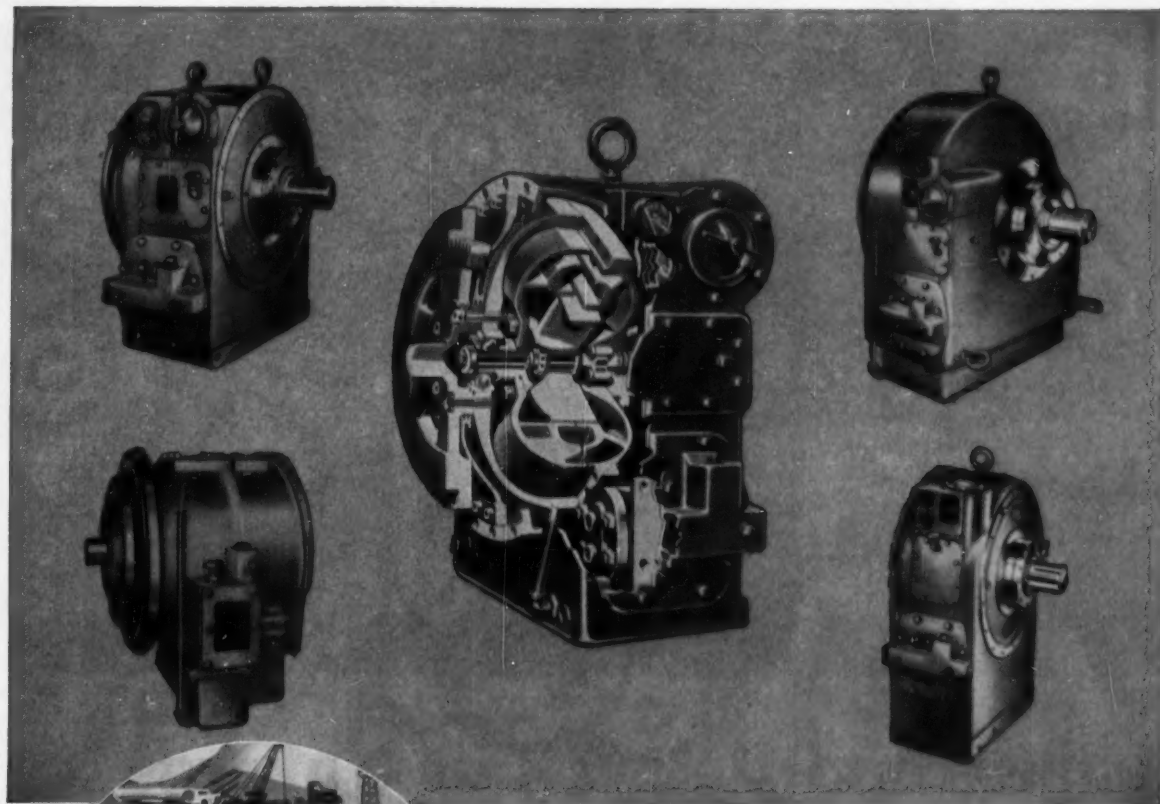
If you would like to consider a rock-bolting program, or if you have any question about how to install anchor bolts, we'll be pleased to have a representative call at your convenience. All you need do is drop a line to the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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BETHLEHEM STEEL





For your power need, whatever it is, there's a "right" **TORCON Model**

With a horsepower range from 15 to 600, and fly-wheel diameters from 11 to 26 inches, Torcon has a model that's right for your need—a standard unit available immediately for original equipment or for field installation.

Your real benefits begin after Torcon is installed—

- more work and less wear: Torcon blade design balances engine efficiency and horsepower through the working range—smooth, shockless power that reduces wear, prolongs life
- integral unit includes oil pump, sump, pressure regulator; much better efficiency with minimum maintenance

Are you constantly on the look-out for ways to get more efficient power at less cost? Talk to Clark—on all problems of power transmission, from flywheel to point of torque application. You'll find, as do many leading equipment manufacturers, that it's "good business to do business with Clark".

CLARK EQUIPMENT COMPANY, Transmission Division
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Other Products of the Clark Automotive Division . . . TRANSMISSIONS • AXLE HOUSINGS • TRACTOR UNITS • TORCON TORQUE CONVERTERS • ELECTRIC STEEL CASTINGS • GEARS and FORGINGS • FRONT and REAR AXLES for TRUCKS, BUSES and OFF-HIGHWAY EQUIPMENT.

SEND FOR THIS TORCON BULLETIN



—a concise, helpful statement on how Torcon installations cut operating costs, prolong equipment life.

CLARK[®] EQUIPMENT



Millisecond Delays Cut Hazards



Of Blasting in Built-Up Areas

MILLISECOND DELAY patterns and thoroughly confined charges were the key to successful blasting on the difficult stretch of the New York Thruway in Yonkers. They reduced the dangers of ground vibration, flying rock, and ear-shattering air-snap. And helped the contractor maintain good public relations.

Engineered blasting was a *must* on the job. Joint-venture contractors, Yonkers Contracting Co. and Corbetta Construction Co., had one of the most potentially hazardous sections of the Thruway. The job included more than 375,000 yd of rock, and much of it was interspersed among homes, apartments, houses, schools, hospitals, a post office and a racetrack.

Rock lay in horizontal laminations from 6-in. to 3-ft or more thick. In one section the layers of rock lay nearly vertically. Maximum depth of cut was 40 ft. Blast holes ranging from 18 to 30 ft deep were loaded with either Atlas 40% Gelatin or Atlas Gelodyn No. 1.

Basic Pattern

Basically, an alternate-progressive millisecond delay blasting pattern, as shown in Figure 1, below, was used throughout. Throw of rock, was influenced towards the low numbered delays. In most shots, the lower delays were spotted closest to the free face of the burden.

About 90% of the blasting was done in restricted locations. Holes were spaced on 4-ft centers, and only bottoms of holes were loaded. At least 10 ft of sand stemming was tamped atop each charge. Primed cartridges were placed near the bottom of holes. Initiation of each loaded hole at the point of greatest confinement made maximum use of energy. It produced good fragmentation, while



BLASTED ROCK in path of New York Thruway in busy City of Yonkers is excavated by Northwest 80D 2½-yd shovel and loaded into Euclid truck. Note proximity of houses.

reducing flying rock and blast noise.

Generally, shots were fired across one-half of the right-of-way. Work progressed along the axis of the highway with cuts made on alternate sides of the centerline. As one shot was loaded, the next adjacent one was drilled.

Special Patterns

Special situations required special patterns and techniques. Probably the most difficult shooting took place where the Thruway passes under McLean Ave. near the southern end of the contract. At this point the sunken Thruway separates the parallel north and southbound lanes of relocated Central Park Ave. At the deepest point of the cut, McLean Ave. intersects Central Park Ave. at grade and spans the Thruway. (Figure 2, page 136.)

Besides protecting structures and utilities, the contractor had to worry about retaining walls built in the early stages of the job to

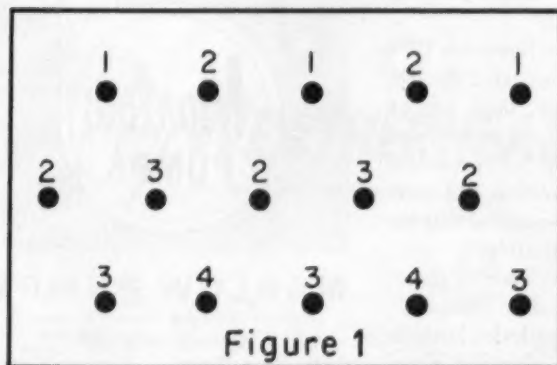
support relocated Central Park Ave. Bulk of the rock lay not less than 1 nor more than 3 ft from retaining walls, and at the intersection of McLean Ave. relocated utilities ran only 6 ft from the side of the cut. Circled letters in Figure 2 indicate the order in which the sections of rock were removed. In sections A and B, slight modification of the standard alternate-progressive pattern provided a longer delay period between rows closest to the retaining walls and produced a throw of rock away from this area of danger. Along the backwalls of sections A and B, longer delays between the last two rows of holes insured that back-break would not damage McLean Ave.

Removal of sections A and B left only McLean Ave. in the path of the completed cut. This rock was removed in four stages. The center sections (C and D) were removed first, making it possible to shear the final sections (E and F) cleanly by providing three free faces for the final burden.

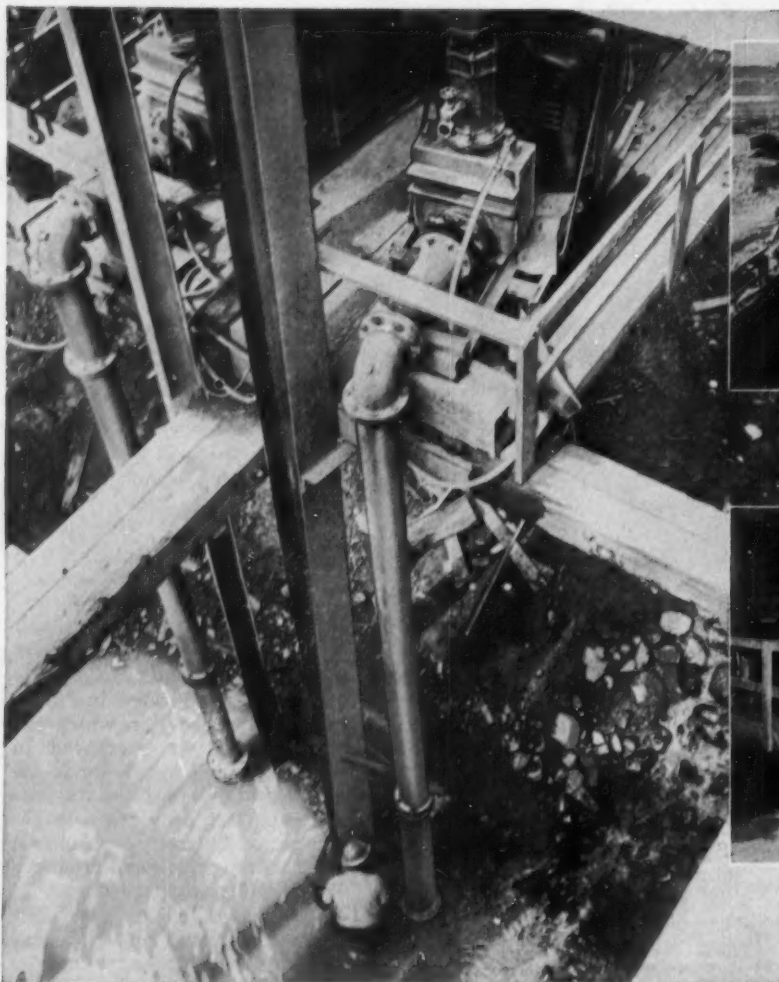
Sections E and F were shot with several blasts. Figure 5 shows the pattern used to make the final shot in section E. It is again a modified alternate-progressive pattern designed to throw towards the center of the right-of-way by providing a relatively long delay in the back row. This exaggerated delay insured that the last row would shoot to the free face, shearing the back wall cleanly. The final shot in Section F was made in the same manner.

In another area, a cut had to be widened on each side of a heavily traveled parkway. The earlier shooting caps were placed in the

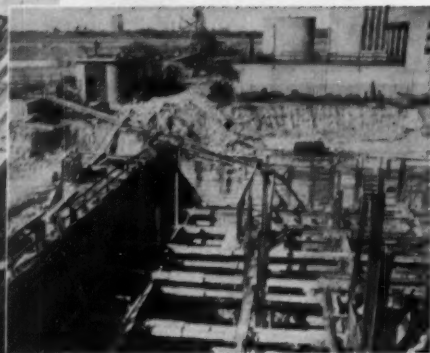
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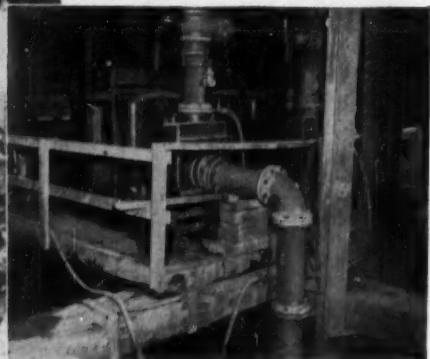
HOLE PATTERN for confined areas is alternate-progressive type. Numbers refer to specific caps in Atlas series.



Deep well is 65 feet below grade and only 100 feet from water front.



A general view of excavation for new pumping building at Bowery Bay Sewage Disposal Plant. The lift is 24 feet and the discharge is through 250 feet of pipe.



A Tachometer placed on these engines showed 1400 RPM, well below the 1800 RPM maximum recommended by the manufacturer. These Model 8F3 Marlows have an AGC rating of 125,000 GPH.

Contractor Handles Seepage 65 Feet Below Grade

PUMPS WORK STEADILY LESS THAN 100 FEET FROM RIVER

PUMPING IS AN important part of the deep coffer dam work proceeding at the Bowery Bay Sewage Treatment Plant in New York City. At a new pumping building, it was necessary for the contractor, J. Rich Steers, Inc., to excavate 65 feet below grade, in a permeable formation less than 100 feet from Bowery Bay.

A constant stream of seepage is controlled by two Marlow 8-inch pumps operating as a team, each running 12 hours on and 12 off. Throttling valves on the discharge lines regulate the flow so that the pumps operate steadily, rather than pumping and priming alternately.

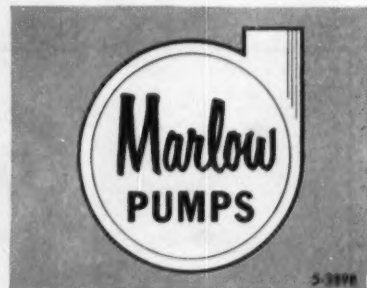
Suction lift on the pumps is 24 feet,

but will be reduced to 12 feet as soon as steel is placed and a platform can be built. The present position allows complete freedom for men to work without interference from the pumping equipment.

Pumping started in November 1954 and will continue through 1956. On this \$13,000,000 job, there are 11 Marlow pumps, both self-primers and Mud-Hogs. Because of permeable earth, depth of excavation, and water front location, it is essential that the pumps operate dependably.

Need dependable dewatering pumps that will keep your job on schedule — then call your Marlow dealer. Look for his name in your classified phone

book, or write for complete information on Marlow pumps . . . and the name of your Marlow dealer.



MARLOW PUMPS

Division of Bell & Gossett Company

RIDGEWOOD, NEW JERSEY

Morton Grove, Illinois

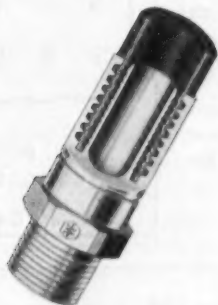
Longview, Texas







progressive construction men depend on **WEATHERHEAD** "right now" swaged hose assembly service!

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YOUR WEATHERHEAD DISTRIBUTOR'S "RIGHT-NOW" HOSE ASSEMBLY SERVICE GIVES YOU THESE IMPORTANT ADVANTAGES . . .



-  Reduces downtime to a minimum
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-  All orders filled **NOW!** Write, wire or phone
-  Stand-by service at no additional cost
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Bulk Hose and Reusable Hose Ends



Drain and Shutoff Cocks



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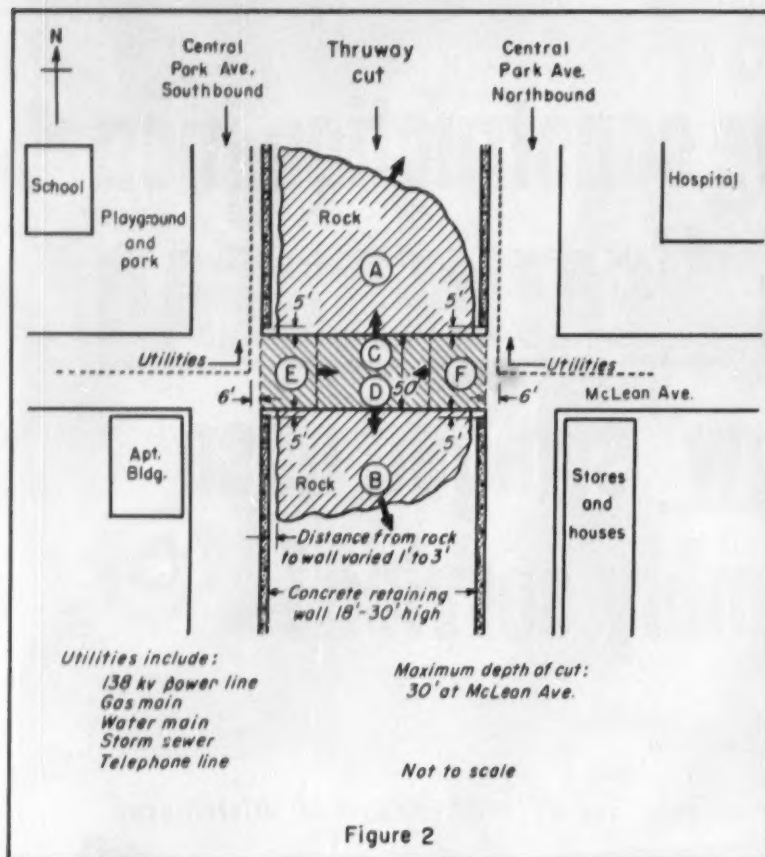
Brass



Ermete ®



Hose Assemblies



MOST DIFFICULT BLASTING problem was at intersection where Central Park Ave. was first relocated to provide separated roadways straddling sunken Thruway. Retaining walls were built in blasted trenches to support relocated roadways. To blast remaining core, contractor had to protect structures, utilities, and walls. Circled letters show sequence of shots.

up-slope holes, and the delay period was lengthened between the lower two rows of holes to insure an up-slope throw. The basic alternate-progressive pattern was used except in the lowest row of holes. The shot provided excellent fragmentation and control of throw. Traffic was interrupted only for the duration of the blast and not a rock fell on the Parkway. (See figure 6.)

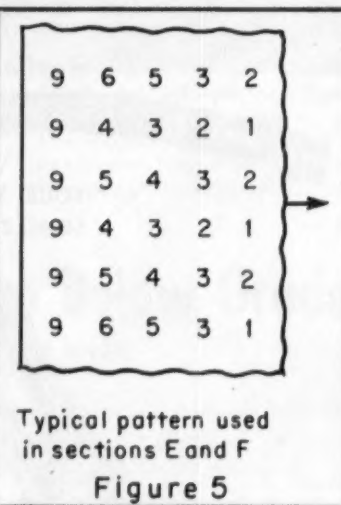
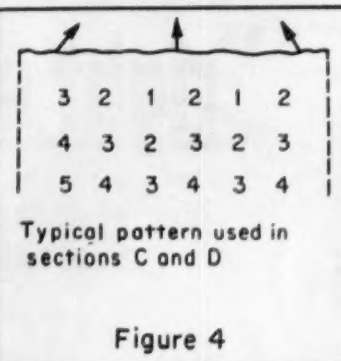
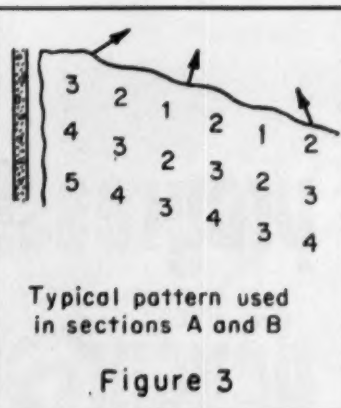
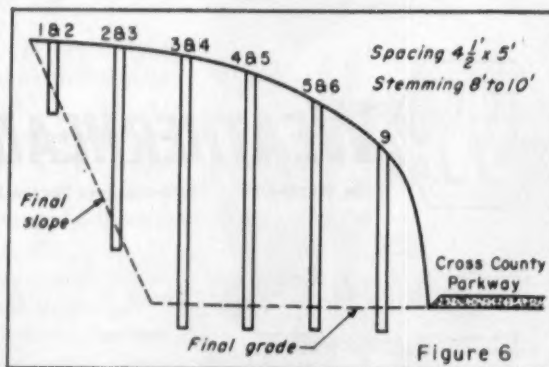
Vertical Laminations

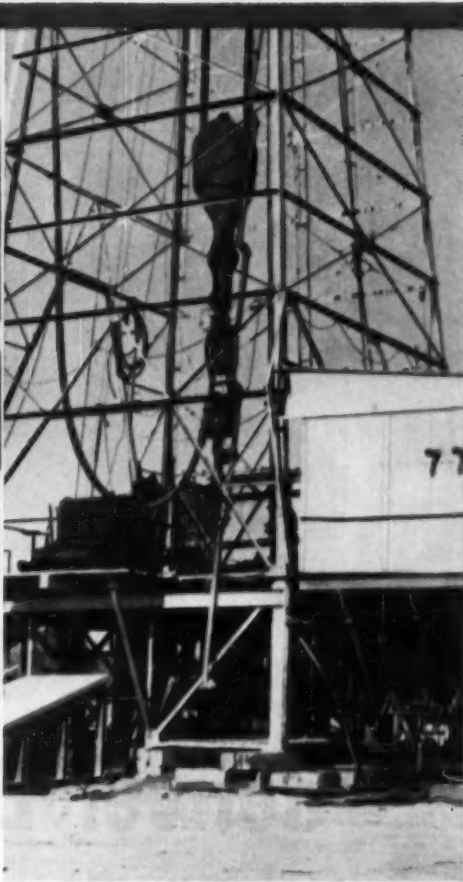
In one section the laminated rock lay vertically rather than horizontally, and paralleling the Thruway axis. Here the blasting pattern was modified by rotating it through 90 deg. Thus the line of least resistance followed by the staggered action of the delayed charges was through the rock perpendicular to the length of the vertical seams. The force of the blast worked on the rock rather than escaping

through the seams to leave a muck pile of oversize boulders. Although a house was located less than 10 ft away, it was undamaged.

James Lytle was project manager and Edward Kennedy was rock superintendent for Corbetta-Yonkers.

UP-SLOPE shooting protects parkway. Earlier shooting caps are placed in up-slope holes and delay period between last two rows is lengthened.





A typical Murray drilling rig powered with 220-hp. LRO Waukesha and 230-hp. V-12 Le Roi engine.

How a steak dinner saved me \$1,000 a day!

by L. D. Murray, Murray Drilling Co., Houston, Texas

"Engine failure due to overheating used to be a big problem when I was drilling in West Texas... downtime was costing me as much as \$1,000 a day.

"Conditions were the worst I've ever encountered before or since. There were no prevailing winds to head the engines into. We were drilling 13,700-foot wells at an altitude of 4,200 feet and temperatures often ranged upwards of 100°. Consequently, our engines were constantly running well above the boiling point and at times they'd pull the mercury down to 9 or 10 inches. You can guess the rest... with expenses running about \$25,000 a year on each of six engines, we were not exactly getting rich.

"Well, one day I told a friend of mine about my engine troubles, and he told me if I'd buy him a steak he'd solve my problems. So I bought him that steak (it was even big by Texas standards), and he told me to try Union's T5X Motor Oil... just that and nothing more. So before we'd finished lunch, I ordered five barrels of T5X sent out to the rigs.

"From that day on, our engine troubles were over. Water temperatures held at 190° and oil consumption dropped from 10 gallons to 1, sometimes even half-a-gallon per day.

Instead of changing oil every Sunday morning, we found we could run T5X Motor Oil 500 hours, changing it and the filters every third or fourth Sunday. And would those engines deliver on T5X! If I had to shut one down for any reason, the other two would pull the load.

"To make a long story short those engines stayed on the line for three years after that, using only T5X, and the only expense aside from routine maintenance was an occasional tuneup. I think that Union T5X is so far ahead of any other motor oil, it's impossible to compare them."

What more can we add except to remind you that T5X, the *amazing* purple motor oil, is immediately available from your nearby Union Oil representative.

UNION OIL COMPANY
OF CALIFORNIA



Los Angeles: Union Oil Bldg. • New York: 45 Rockefeller Plaza • Chicago: 1612 Bankers Bldg. • Philadelphia: Eastwick Ave. & Edgewood St.
Dallas: 313 Fidelity Union Life Bldg. • Kansas City, Mo.: 612 W. 47th St.
New Orleans: 644 Nat'l Bank of Commerce Bldg. • Boston: 214 Harvard Ave



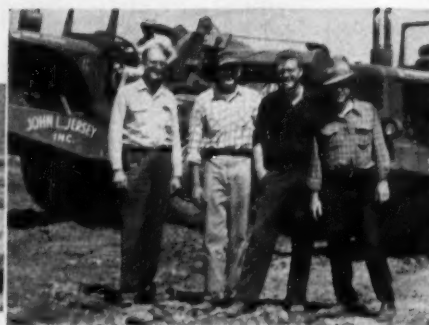
27-second loading.

deliver EXTRA "PAY-DIRT"



▲
Note how extra-high Payscraper apron-lift provides obstruction-free room for fast unloading. And straight-line, power-saving ejector reaving leaves more power on Payscraper wheels, to speed dumping and spreading.

▲
Air-assisted clutch; big, safe, 4-wheel air brakes; exclusive Hydra-Steer — all contribute to give the Payscraper its outstanding operating ease and safety. The two Payscrapers and two other towed scrapers are push-loaded by the TD-24.



▲
Left to right: John L. Jersey; J. M. Harris, Supt.; Dale Jersey, Supt.; and William Donaco, General Supt. of the job.





.. plus super-fast get-away..
on industrial district job
for John L. Jersey, Inc., Portland, Oregon

John L. Jersey, Inc., Portland, Oregon, uses International "55" Payscraper loading and transport speed—and famous TD-24 *follow-through* push-loading—to highball the 833,000-cu-yd Rockwood Industrial District contract to timely, profitable completion.

In only 27 stop-watch-certified seconds, and only 60 to 100 feet of travel, each "55" Payscraper's bowl boils heaping full of gravelly soil—and the "55" is off to the fill at up to 20 mph!

"More dirt on the fill"—more dough in the till

Owner John L. Jersey reports: "Last year we put over 2,000 hours on both our '55' Payscrapers with cable replacements as the only necessary repairs. This year we

got two more '55's and a new TD-24 to load them fast. I believe '55's are the most scraper for the money.

"We've found our '55's' load in 25-30 seconds. They're simple and easy to maintain and operate. Quick, full-load Payscraper get-away means more dirt on the fill, and that's what we get paid for."

Largest of its kind in the Pacific Northwest, the triple-terraced, 188-acre Rockwood project, on the Columbia river, is a Union Pacific Railroad Co. development—to attract new industry to the Portland area.

Prove to yourself no other rubber-tired dirt-mover gives you the new Payscraper combination of capacity-adding performance features! See your International Construction Equipment Distributor for a demonstration!

See you at the ROAD SHOW—CHICAGO—Jan. 27 to Feb. 4, 1957



INTERNATIONAL®
Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Broom-Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

TWO LOAD-SPEEDING **International "95"**

average 2400 cu. yds. of rock



TWO-TON CHUNKS OF LIMESTONE bang down into the huge Payhauler body—the rugged high-tensile steel sides, triple-section bottom, and super-duty “spring cushions” are built to take rock-shock! And the “95” Payhauler frame is strongest known of any off-highway truck in its class.



WITHOUT LOSING A SWING, 3 cu yd shovel always finds “95” waiting for load. Powerful, fuel-saving 335 hp Turbo-charged diesel engine keeps power high, reduces fuel consumption 10% or more. Maximum engine torque is transmitted efficiently through new cerametallic clutch and shock-saving planetary final drive into greater pay-off work power!



BODY UP... DOWN... IN ONLY 12 SECONDS! Three-stage, double-action hydraulic hoist provides full-time power control. Built-in hydraulic snubber valves assure smooth, over-center dumping action and gentles body return. Proper weight distribution permits safe dumping at edge of fill, yet drive wheels carry ample weight for steep-grade traction.



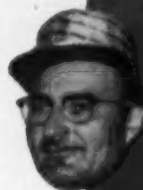
2,000 ft.
cycle includes
12% grade

NO FOOT-BRAKING DOWN-GRADE! Heap-loaded "95" Payhauler rolls along safely down to the fill at 10 mph. Hand-operated Torqmatic brake, "torque converter in reverse" is standard equipment, gives accurate, confidence-building control at any speed...on any grade. Earl

and Roy Schenewerk, operators of the "95's," say, "Because of Torqmatic brakes, these Payhaulers operate easier, smoother and safer than any other unit we've ever driven. Now, we have no worry on this steep grade!"

Payhaulers

per 10-hour day!



"Best
Production
I've ever had,"

H. D. BROWN
Project Superintendent,
Clarkson Construction Co.,
Kansas City, Mo.

High speed (up to 38 mph.), 16 cu yd capacity, and next-to-automatic operating control of two new International "95" payhaulers are getting Clarkson Construction Co. record-breaking rock production of 2400 cu yds per 10-hour day. Payhaulers are producing this outstanding yardage on the company's 1000-foot cut through dolomite limestone—part of their 7.5 mile, 2-lane highway contract between Bonne Terre, and Halifax, Mo.

The Payhaulers are operating on a 2000-foot cycle which includes a 12% grade. On this grade, too tricky and treacherous for Clarkson's other rock haulers, Payhaulers maneuver speedily and safely downgrade—under positive Torqmatic braking control! Payhaulers'

high speed of up to 38 mph also permits the fast average round-trip travel time of only 2 min, 45 sec. That's faster than the 3 cu yd shovel can load one!

H. D. Brown, Project Superintendent, says, "The Payhaulers have got all other rock trucks beat. Control we've had with Payhaulers on this job is something we didn't have on any other truck. We've averaged 150 to 162 loads of 16 to 18 cu yds per 10-hour day. It's the best production I've ever had!"

Other veteran rock men who have used or seen the International "95" Payhauler in action say the same thing. You'll join them, too! Ask your nearby International construction equipment distributor to give you a demonstration.



INTERNATIONAL® Construction Equipment

International Harvester Company, 160 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Beam Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

EXCLUSIVE...NEW...

International-Drott TD-18

3 yd 4 in 1

Here's the big one of the famous International-Drott Four-in-One Skid-Shovel family, the new 3-yd TD-18 Four-in-One! Its bucket of 4-inch new 5-1 alloy steel equals 10-inch high tensile manganese steel in strength—saves a ton of weight—boosts your production! And like all Four-in-Ones, this one completely eliminates the need for switching attachments!



It's a 3-yd. Skid-Shovel...



with Drott's exclusive "concrete-shattering" triple-power pry-over-shoe break-out action—and 42" ground level bucket roll-back. Skid-Shovel position also gives you time-gaining, strain-saving load transport on the exclusive Skid-Shoes!

It's a 3-yd. Clamshell...



that "surrounds" loose materials and fills in one fast gulp. And the bottom-dumping clamshell gives you a 2½-foot dumping height advantage over ordinary roll-forward buckets—plus positive, clean-out action even when handling sticky materials!

"FLEET-BEATING PERFORMER"

"A new 3-yd. TD-18 4-In-1 Skid-Shovel proved able to do as much work as 3 power shovels and a drag-line digging up and loading old concrete pavement on one of my recent highway jobs," reports Henry E. Berghuis, Prinsburg, Minn. "The 4-In-1 loaded up to 1,700 lineal feet of old pavement daily. Using 4-In-1 Clamshell bottom dumping, I also loaded out 4,500 yards of wet, sticky gumbo no other loader could tackle!"





NOW..
big-scale
four-machine
utility!

It's a **3-yd. Bullclam...**



that gives you regular "carry-type scraper" action to grade, strip or spread with inch-close accuracy, using clam lip control. Plus exclusive Drott Bullclam efficiency on all Sanitary Landfill operations including positive fill compaction!

It's a **BIG** -capacity Bulldozer



with clam lip up, and shoes on the ground, the blade rolls the earth with precision. You regulate dozing depth with ease and accuracy by hydraulic "radius control" of blade pitch (forward and backward).

Touch the new 3-yard TD-18 Four-In-One's machine-selector lever! See how you instantly get any material-moving action you need—from the seat, with finger-tip ease—and stopped or on-the-go. Prove you can beat a fleet of limited-duty rigs with this versatility unlimited—get big-income, tough jobs other rigs

can't handle! Compare the capacity-adding advantages of Drott exclusives like shock-swallowing Hydro-Spring and heap-keeping, parallelogram raise action. See your nearby International Drott distributor for a TD-18 Four-In-One demonstration. Or try the 1-yd. TD-6, 1½-yd. TD-9, or 2¼-yd. TD-14 Four-In-One!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL®
DROTT®

See you at the
ROAD SHOW—CHICAGO
Jan. 28-Feb. 2, 1957

BUYER



CF&I



**Your Wickwire Rope
Distributor and our
metallurgist ...
work together for you**

This metallurgist—who is responsible for the quality of our rope wire—is with your Wickwire Distributor every time he makes a call.

True, he's physically in his laboratory, supervising the thorough testing of *both ends of every coil* of wire to assure uniformity throughout the coil. But, whenever your Wickwire Distributor calls, he has the full assurance that metallurgists like this are constantly making sure that the product has the right chemical and physical properties to give long, dependable service.

It's just one more reason why your Wickwire Distributor knows he's got top-quality wire rope, slings and strand to sell... and that these products will serve you well.

4064

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

4. Crushers — Part Two

By W. A. RUNDQUIST,
Vice President,
Pioneer Engineering Works

Reduction Crushers

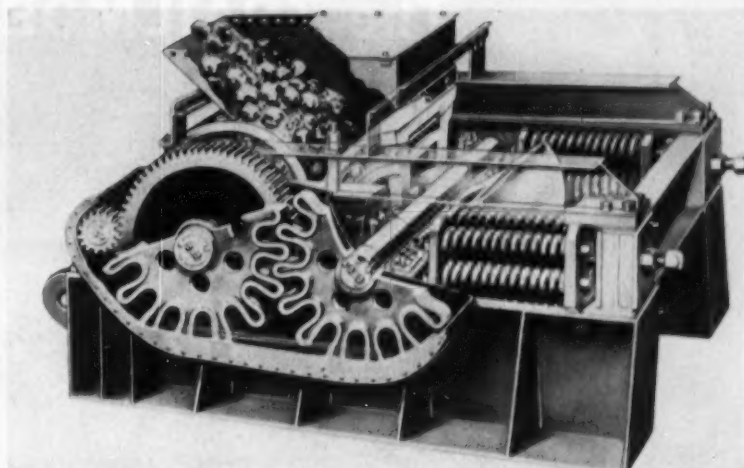
Reduction crushers are intended for use behind the primary breaker. Consequently they are designed to take a smaller size feed and to produce a smaller, generally more uniform, product. Usually a screen is placed between a primary and a reduction crusher to remove material at or below the setting of the reduction crusher.

The two most popular reduction crushers for producing construction aggregates are the roll crusher and the cone crusher. The hammermill is used to a limited extent but finds more favor in the manufacture of such products as agricultural limestone.

Roll Crushers

Roll crushers for reduction are of two types: twin roll and triple roll. They are similar in construction and operation except for the number of rolls.

The twin roll operates in much the same manner as the old-fashioned clothes wringer, the material to be crushed passing between the rolls where it is reduced in size



TWIN ROLL CRUSHER with star gear drive is shown in cutaway section. Note method of feed on to fixed (left) roll to assure even distribution of the material to be crushed.

mainly by compression. Rolls should be of fairly large diameter to prevent slippage of material. Size of product is governed by adjusting the distance between the two rolls.

Because a roll crusher will attempt to take a much larger feed

than that for which it is designed, the maximum size feed is stipulated by manufacturers as a factor of the optimum stage of reduction. Best crushing results and longer crusher wear will be obtained by adhering to manufacturers' recommendations. These recommendations also will include the manner in which the feed should be introduced to the rolls. (See table)

In operation, driving power is applied to one roll, called the fixed or stationary roll. The second roll is driven by the first roll through a "star gear" drive or a chain drive. This second roll is called a floating or movable roll and its adjustability provides the crusher setting.

The triple roll, either built into the crusher at the factory or added in the field, is located above and slightly forward of the fixed roll. It can be adjusted in the same way as the horizontal floating roll in the twin roll crusher and is driven by a star gear in the same manner. Material first is crushed between third and fixed roll, then is further reduced between fixed and lower floating roll.

The addition of the third roll greatly increases the work performed by the crusher by increasing the over-all stage of reduction. This means that a larger size feed

Feeds and Product Sizes Obtainable from Twin Roll Crushers—Stage of Reduction

TYPE OF SHELL		Model		Model		Model		Model		Model			
Stationary Roll	Flotation Roll	Stage of Reduction	Max. and Min. Size of Feed	Max. and Min. Size of Product	Stage of Reduction	Max. and Min. Size of Feed	Max. and Min. Size of Product	Stage of Reduction	Max. and Min. Size of Feed	Max. and Min. Size of Product	Stage of Reduction	Max. and Min. Size of Feed	Max. and Min. Size of Product
Crane Corrugated	Crane Corrugated	4	36" x 36"	1 1/2"	3	48" x 48"	1 1/2"	5	48" x 48"	2 1/2"	1 1/2"	48" x 48"	2 1/2"
Crane Corrugated	Crane Corrugated	4	36" x 36"	1 1/2"	3	48" x 48"	1 1/2"	5	48" x 48"	2 1/2"	1 1/2"	48" x 48"	2 1/2"
Flint Corrugated	Flint Corrugated	8 1/2	72" x 72"	4	2 1/2	60" x 60"	4	2	60" x 60"	2 1/2	1	60" x 60"	2
Flint Corrugated	Flint Corrugated	8 1/2	72" x 72"	4	2 1/2	60" x 60"	4	2	60" x 60"	2 1/2	1	60" x 60"	2
Flint Corrugated	Smooth	2 1/2	36" x 36"	1 1/2"	3	48" x 48"	1 1/2"	5	48" x 48"	2 1/2"	1 1/2"	48" x 48"	2 1/2"
Smooth	Smooth	4	36" x 36"	1 1/2"	3	48" x 48"	1 1/2"	5	48" x 48"	2 1/2"	1 1/2"	48" x 48"	2 1/2"
		1 1/2	18" x 18"	3/4"	1	36" x 36"	3/4"	3	36" x 36"	3/4"	1 1/2	36" x 36"	3/4"
		1 1/2	18" x 18"	3/4"	1	36" x 36"	3/4"	3	36" x 36"	3/4"	1 1/2	36" x 36"	3/4"

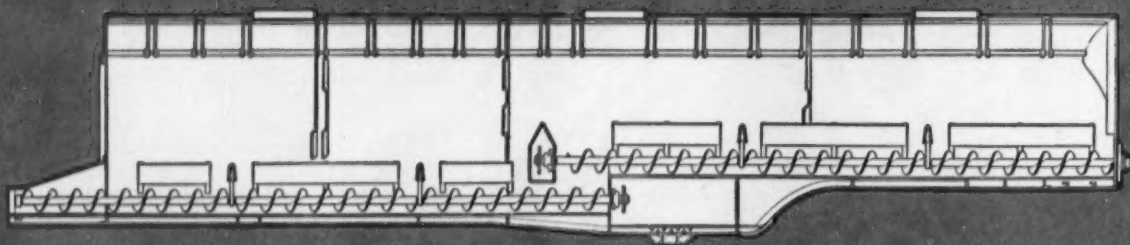
Triple Roll Crusher—Stage of Reduction

TYPE OF SHELL			Model			Model			Model		
Top Flaming Roll	Stationary Roll	Lower Flaming Roll	Stage of Reduction	Maximum Size of Feed	Max. and Min. Size of Product	Stage of Reduction	Maximum Size of Feed	Max. and Min. Size of Product	Stage of Reduction	Maximum Size of Feed	Max. and Min. Size of Product
Crane Corrugated	Flare Corrugated	Flare Corrugated	616	60" x 72" x 36"	6 1 1/2"	5	72" x 72"	2 1/2"	816	60" x 60"	1 1/2"
Crane Corrugated	Flare Corrugated	Smooth	816	60" x 60"	6 1 1/2"	4	60" x 60"	2 1/2"	916	60" x 60"	1 1/2"
Crane Corrugated	Smooth	Smooth	916	60" x 60"	6 1 1/2"	3	72" x 72"	1 1/2"	116	60" x 60"	1 1/2"
Crane Corrugated	Smooth	Smooth	116	60" x 60"	6 1 1/2"	2	72" x 72"	1 1/2"	136	60" x 60"	1 1/2"

Flow on Shell

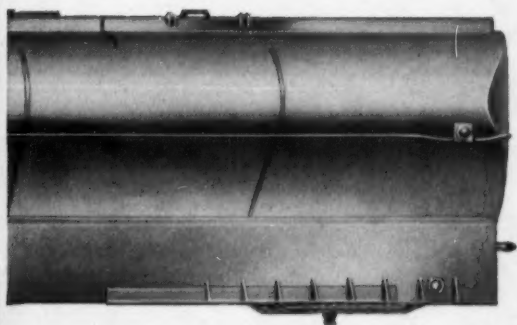
NOTE—All Dimensions in inches. For Low Corrugated Shells, use figures for Fine Corrugated. Size of product and size of feed are based on the size that will pass through narrow openings.
*The first maximum size of feed given for each type of shell refers to the maximum size of material that can be fed the crusher; all sizes given in the same column for each type of shell refer to the maximum size that can be fed in order to obtain the maximum size of product given on the same line in the column immediately to the right. The feed size given in the column for each type of shell is the maximum size that can be fed to obtain the maximum size that the crusher can produce with that type of shell. This maximum size is on the same line in the column immediately to the right.

The TRAILMOBILE model SC



An exclusive step-down design...built for long, trouble-free service

bulk cement trailer



TRAILMOBILE INC.

Cincinnati 9, Ohio • Springfield, Missouri
Longview, Texas • Berkeley 10, California

SPECIFICATIONS

Construction—"V" type Hopper Bottom.

Fill Hatches—Tandem Axle—Four 20" diameter, water-tight covers.

Discharge—Rear, with 10" diameter hose.

Screw Conveyor—Two stage, 9" diameter, with chain drive.

Engine—Twin cylinder, 11 H.P. at 1800 R.P.M., gasoline driven, air cooled, 30 to 1 gear reduction with electric starter, battery and generator.

Screw Speed—Approximately 60 R.P.M.

Air Pads—Five.

Ladders—One on curbside.

King Pin—Interchangeable, with adjustable upper fifth wheel plate.

Props—Vertical, steel, single speed.

Suspension—Trailmobile.

Axles—20,000 lb. tubular.

Brakes—16½" x 7" x ¾" air operated.

Wheels—Spoke type (Steel), lightweight.

Tires—10:00 x 20, 12 ply.

Rims—7.5"

Tire Carrier—None.

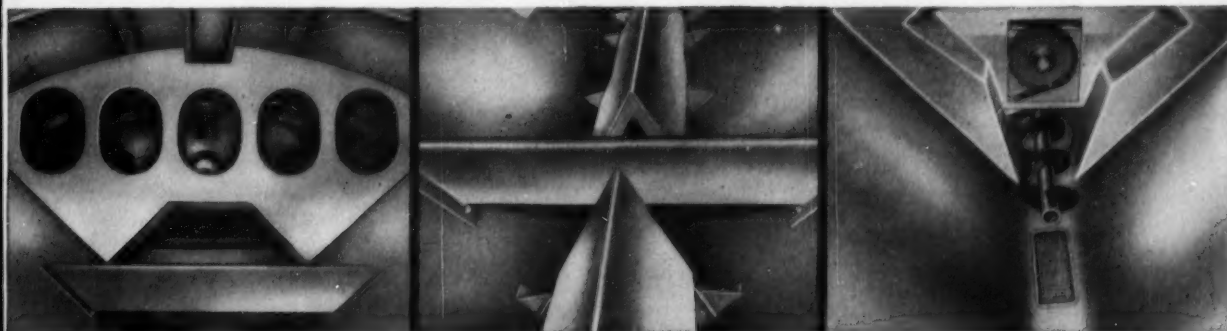
Lights—Stop and tail (2), directional signals, markers, and reflectors per I.C.C. regulations. 6 volt system.

Fenders—None.

Paint—One color.

AVAILABLE IN ALUMINUM OR STEEL

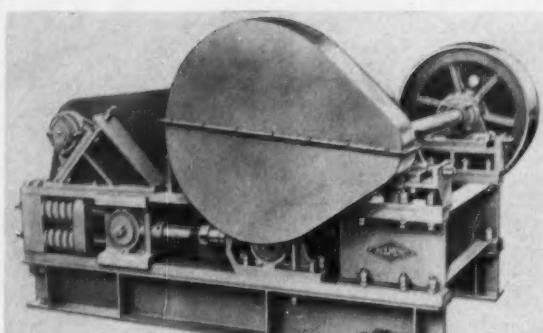
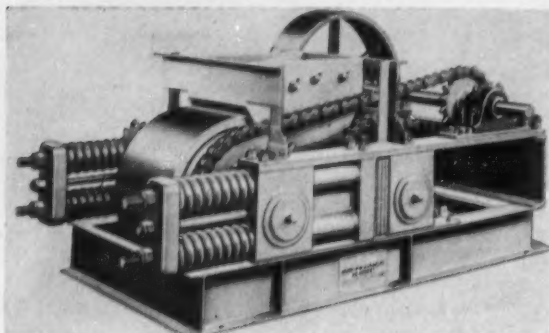
TR-477



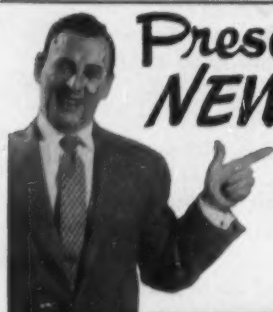
Baffle plates, which eliminate shifting of the load, are part of a strong, interior framework which reinforces the trailer at stress points. Integral tank and frame construction reduces deflection under load—assures free operation of the screws.

Conveyor shelters installed at full length of the screws prevent the load from packing during transit—keep the full weight of the cargo from resting on screws—lessen required starting torque for unloading. Shelters can be removed for maintenance purposes.

Air pads inject compressed air directly to the screw area—erating the packed material. This decreases the torque required to set the unloading screw in motion which results in lower maintenance cost. Operation can be intermittent or continuous.

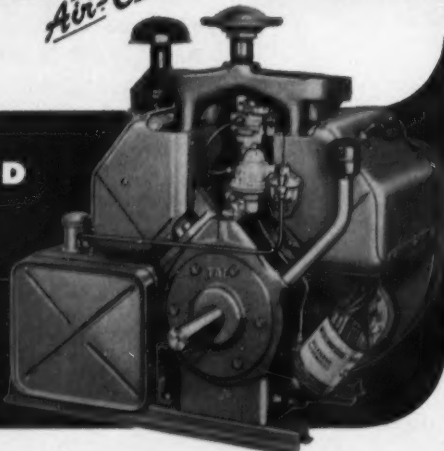


TWIN ROLL CRUSHERS also are made with chain drives, as shown here. Rolls crush by compression; roll spacing governs product size. (TelSmith and Diamond photos)



Presenting another NEW WISCONSIN HEAVY-DUTY *Air-Cooled* ENGINE

the
FULL-POWERED
V-type
4-Cylinder
30 hp.
model VH4



This rugged new engine has been added to the Wisconsin line to fill the horsepower gap between the Model VF4 25 hp. and the Model VG4D 36 hp. Wisconsin Engines. At the same time, the mounting base is dimensionally identical to the Models VE4 and VF4 to permit convenient replacement of the latter engines if greater power is required.

The Model VH4, which now makes its bow for the first time, is the most powerful engine of its type and size available today, in our estimation. It is an engine of basic High Torque design which gives it the important advantage of being able to deliver maximum usable *Lugging Power* that carries the load through the hard, heavy pulls. It has been designed to give you the best possible performance at all engine speeds from 1400 to 2800 rpm., even when operating under intermittent shock-loads or under constant load, continuous service.

The Model VH4 is a heavy-duty engine in all respects, built for hard service under all operating conditions, at temperatures from sub-zero to 140° F. (60° C.). It is an exceptionally smooth-running, even-firing engine and has all the traditional heavy-duty features that characterize all Wisconsin Models, from 3 to 36 hp. It can be supplied as an "open engine" with side-mount fuel tank, or as housed power unit and may be equipped with electric generator and starter (or starter only), clutch, reduction or clutch-reduction assemblies . . . and is adaptable to operation on a variety of fuels such as gasoline, kerosene, natural gas, Butane, Propane or fuel oil of 35 Octane rating or better.

Learn more about this new engine. Write for Bulletin S-196 for detailed data and engineering specifications.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

can be taken by the triple roll crusher than by the twin roll crusher to produce material of a desired size. While it may produce slightly more material than a twin roll crusher having the same size rolls (diameter and face of rolls) the same output tables are used for both crushers. Horsepower requirements for the triple roll are only slightly greater than those for the twin roll.

The triple roll crusher has the advantage over the twin roll of permitting a larger setting of the primary crusher, thereby improving plant operation where the output of the primary is a bottleneck.

Roll crushers have a wide range of adjustment and are adaptable to the production of most construction aggregates down to about minus ¼ in. Sticky materials may pancake on the rolls, but usually will not clog the crusher.

Size of roll crusher is designated, in inches, by the diameter of the roll and the length of the roll.

Cone Crushers

Cone crushers are in reality gyratory crushers with the mantle and bowl modified for reduction rather than primary crushing. The mantle is flared to a relatively larger diameter skirt at the bottom of the crushing chamber, and the bowl is constructed to follow the contour of the mantle. The shaft through the mantle is not suspended at the top; rather there is a feed plate at the top that helps govern the size of the feed the crusher will take. This plate also serves to agitate the feed so it flows uniformly into the crushing chamber.

Because the range of adjustment is not as wide in the cone crusher as in the roll crusher, two types of



Area too cramped, material too wet for power shovels... so Alley Construction Company loads mud-imbedded boulders with 2¼-yd Michigan

On this section of Minnesota State Highway 76 near Witoka, Alley Construction Company's relocation contract called for cutting the new right-of-way through a hill of huge, clay-imbedded limestone boulders. Despite unusually tough conditions—including limited work space and deep mud—Alley successfully used their 2¼ yard Michigan Tractor Shovel for the work. Some of the chunks handled weighed over 7 tons each, and measured 3 to 6 feet in diameter.

On job all summer

Normally the job would have called for a 1½ or 2 yard power shovel, says

Owner Merle Alley, but at the time work was started, the cut was too narrow and the material too wet and sticky for any crawler-excavator. So the company tried their Michigan Tractor Shovel instead, even though they considered this an unusually tough and "practically impossible" assignment for any rubber-tired machine. *The Michigan, however, worked "perfectly".* So perfectly, in fact, that Alley kept it on the rock sections of their 7½-mile, \$747,000, million-yard contract *all summer.* "It loaded more material, and worked more efficiently than any shovel or loader we had on the job," said Mr. Alley. No mechanical troubles were noted, in spite of the extremely heavy lifting and soft footing.

Drives job-to-job at 24 mph

"We liked its speed, too," Mr. Alley says. "At 24 mph it got where it was needed in a hurry—and we never needed a trailer to move it. We did the toughest assignments with it—work no other make of tractor shovel could even touch."

Try one on your work

Like Mr. Alley, more and more owners have found a Michigan will handle jobs which have always been considered too tough for rubber-tire tractor shovels. The exclusive Clark power-train—3-to-1 torque converter, no-clutch power-shift transmission, and planetary-wheel drive axles—gives the Michigan more usable power and traction than you've ever seen on this type of machine. Your Michigan distributor would like the chance to prove it. Ask him to demonstrate on one of your tough jobs—you name it.

Michigan is a registered trade-mark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 43, Michigan

CLARK[®]
EQUIPMENT



Prompt, expert service from local Michigan distributor, Mork-Witthauer Co., Minneapolis, keeps Alley's work-efficiency high.

A size and bucket to fit your needs • 7 basic models, gas or diesel, 44 to 165 hp, front, rear and all-wheel drive • 35 different buckets and attachments, 6 cubic

feet to 5 cubic yards • All models available, under Michigan Lease-Purchase Plan, with no money down. See your Michigan distributor for details.

The Problem:

To get water for irrigation from one side of the Rio Grande to the other

The Solution:

D. D. Skousen & Son, Albuquerque contractor, builds 1200-ft. siphon under the river with

BLAW-KNOX STEEL FORMS

• One of the most unusual projects in which Blaw-Knox Steel Forms have played an important part is the construction of a siphon under the Rio Grande near Albuquerque, New Mexico. The siphon is necessary to divert water from one side of the river to the other during the low water season, so that irrigation can be maintained on either side of the river. The 84" diameter concrete conduit, with 15" thick walls reinforced with steel, dips 40 ft. below the river bed at one point.

One of the most important aspects of this job was the time-pressure under which contractor D. D. Skousen & Son worked. The entire job had to be completed between November 15 and the annual Spring high water period. By the use of specially built Blaw-Knox Forms, Skousen was able to set and pour two 25-ft. sections of conduit per day. Working seven days a week, the project was completed without delay.

Siphons, Sewers, Big Dams, Bridges—whatever your concreting problem—solve it the low-cost way by taking advantage of Blaw-Knox forming experience. Bulletin 2430 contains special design suggestions and complete details about the Blaw-Knox Steel Form Consultation Service. Send for it today, while your next job is in the preliminary planning stage.



BLAW-KNOX COMPANY

STEEL FORMS DEPARTMENT

BLAW-KNOX EQUIPMENT DIVISION

P.O. BOX 1198 • PITTSBURGH 30, PA.

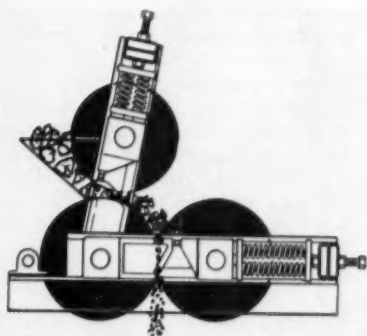
PHONE STERLING 1-2700

BLAW-KNOX STEEL FORMS
CONSULTATION SERVICE



PRODUCING AGGREGATES...

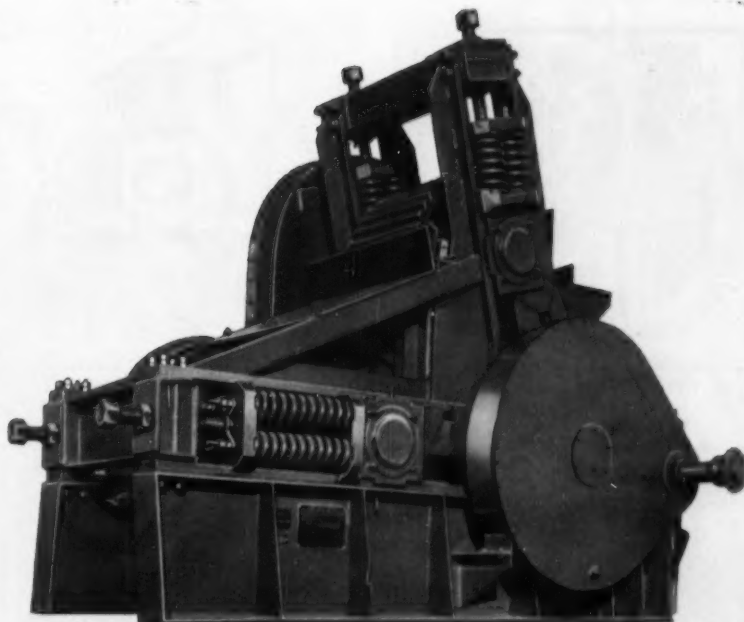
continued from page 148



MATERIAL fed to triple roll crusher is reduced in two stages as it passes through.

crusher heads are usually made available. These are the "standard head" for the coarser sizes of product and the "short head" for the finer sizes. Various types of adjustment for the size of product are provided by different manufacturers, including shims, screws, and hydraulic means. Forced feed lubrication is generally applied.

The size of cone crusher usually is designated in feet, and is meas-



TRIPLE ROLL CRUSHER is fitted with third roll above and slightly forward of the fixed roll. Like lower floating roll, third roll is adjustable and is driven by star gears.

ured as the diameter of the mantle at the lower end.

In most stationary plant installations for the production of con-

struction aggregates, the roll crusher and the cone crusher may be considered interchangeable. The weights of the two for comparable

Almost undetectable repairs in concrete... with FELKER Diamond Blades and Machines



There's no need for rough broken edges, irregular patches, when making repairs in existing concrete. The modern method is pre-cutting to partial depth with Felker Segmented Diamond Blades before you break! Jobs go faster, are neater and savings offset cutting costs!

Felker supplies a wide range of diamond blade sizes, in types for cutting both green and cured concrete with maximum efficiency. Ask for price list and recommendations for lowest cost per cut!

FELKER CONCRETE CUTTING MACHINES—Made in sizes from 7½ h.p. through 36 h.p. for all jobs from patchwork to production cutting of control joints in highways, etc. Catalogs available. Write, specifying your requirements.

FELKER MANUFACTURING CO.
Torrance, California

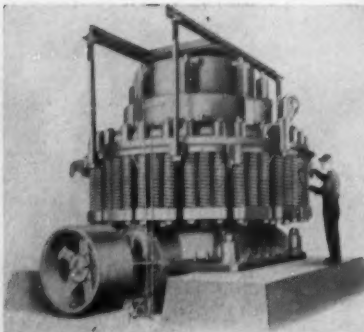
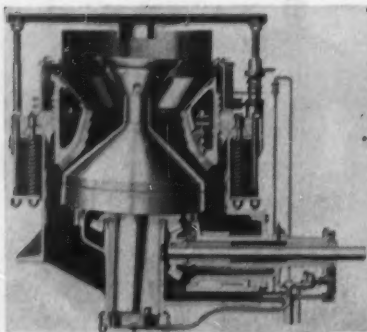


A typical patch resulting from broken edges, poorly bonded, ragged and unsightly.

Vertical edges of cuts improve neatness, won't spall. Concrete fill, rather than asphalt, is unnoticeable.

World's Largest and Oldest Manufacturer of
Diamond Abrasive Cut-Off Blades and Machines.





CONE CRUSHERS are similar to gyratories, with modified mantle and bowl. Standard head type (left) produces coarser sizes; short head (right), finer sizes. (Nordberg photos)



Here's the business end of a heater

When you buy a heater, don't stand in front of it; stand behind it. All heaters are hot in front, but their value to you depends on the rear end.

If you want *circulated warm air indoors, powerful spot heating outside, if you want to dry plaster, pour and cure concrete and keep the job rolling in any weather*, you need a Master heater.

It's a compact furnace-on-wheels, with starter, fan, thermostat, filter, pressure atomizing burner, insulated fire chamber and all. It rolls into place, starts at the flip of a switch, needs no vent and burns low cost kerosene or fuel oil.

We think it gives you more good heating for your money than any other type heater. Write for the free folder "Summer Warmth in Winter" or call your Master Distributor and see if you don't agree.

MASTER VIBRATOR COMPANY
304 Stanley Ave., Dayton 1, Ohio

MASTER

PRODUCING AGGREGATES . . . continued from page 151

capacities of similar size materials are fairly equal. While considerably shorter in height than gyratories for primary crushing, cone crushers require more headroom than roll crushers and require more space underneath for removal of the finished product. Further, where great flexibility in producing many sizes is required, the crushing heads on cone crushers may have to be changed, whereas the full range of adjustment of the roll crusher can be accomplished with the means provided in the single machine.

Cone crushers may pack badly in sticky materials. As to quality of product, there is little choice between cone and roll. Both produce a cubical product under good crushing conditions. Both produce some flats if the material is such that it breaks in layers at or near the setting to produce the desired size of product. Choke feeding both types of crushers aids in reducing flats. Increasing the speed of the roll crusher not to exceed 25% further aids in the production of better cubes in the smaller product size range.

When the crushers are operated in closed circuit, that is, when the product from the crusher is screened and the oversize returned to the crusher, it will be found that the roll crusher produces a larger percentage passing a given screen opening with resultant less return to the crusher.

Hammermills

The hammermill is a machine with a series of hammers aligned on a rotor shaft. Crushing is accomplished by impact as in the impact type of primary crusher. In addition, however, the hammermill is equipped with a grate at the bottom so that the hammers, in revolving, grind the broken material against the grate until it is small enough to fall between the bars in the grate.

Because this is a form of attrition crushing, hammermills are not recommended for materials having a high abrasive value as the cost of maintenance of hammers and grating becomes excessive. In sticky materials or materials where a large amount of fines is required, hammermills frequently are used regardless of maintenance costs as a means to an end.

There are perhaps more vari-



Royal Cord Air Hose



WEAKLINGS DON'T LAST HERE...

It takes U. S. Royal Cord (the air hose built like a tire) to handle jobs like this—to take the worst kind of punishment *wherever* air lines are used. The cord construction increases resistance to internal pressure, yet produces a hose of extreme flexibility. U. S. Royal Cord has remarkable resistance to blows or bruises caused by blasting, or by heavy tools falling on the hose or by trucks and other vehicles running over it. *Never needs cribbing.* Its smooth, brown cover is the *toughest* ever put on a molded

hose. No matter how great the shock, no matter how excessive the pressures on any job, U. S. Royal Cord is the *quality* air hose that pays off—in jobs performed and in long life. It proves that it never pays to buy cheaply-constructed hose.

U. S. Royal Cord Air Hose is obtainable at any of the 28 "U. S." District Sales Offices, at selected "U. S." distributors, or by writing U. S. Rubber, Mechanical Goods Division, Rockefeller Center, New York 20, N. Y.

Watch NCAA football, Saturday afternoons, NBC-TV



Mechanical Goods Division

United States Rubber



100 SERIES

MODEL	175 BC	175 BT	195 BT
CAPACITY	1/2-yard	12 1/2-tons	15-tons

AMERICAN ADDS 5

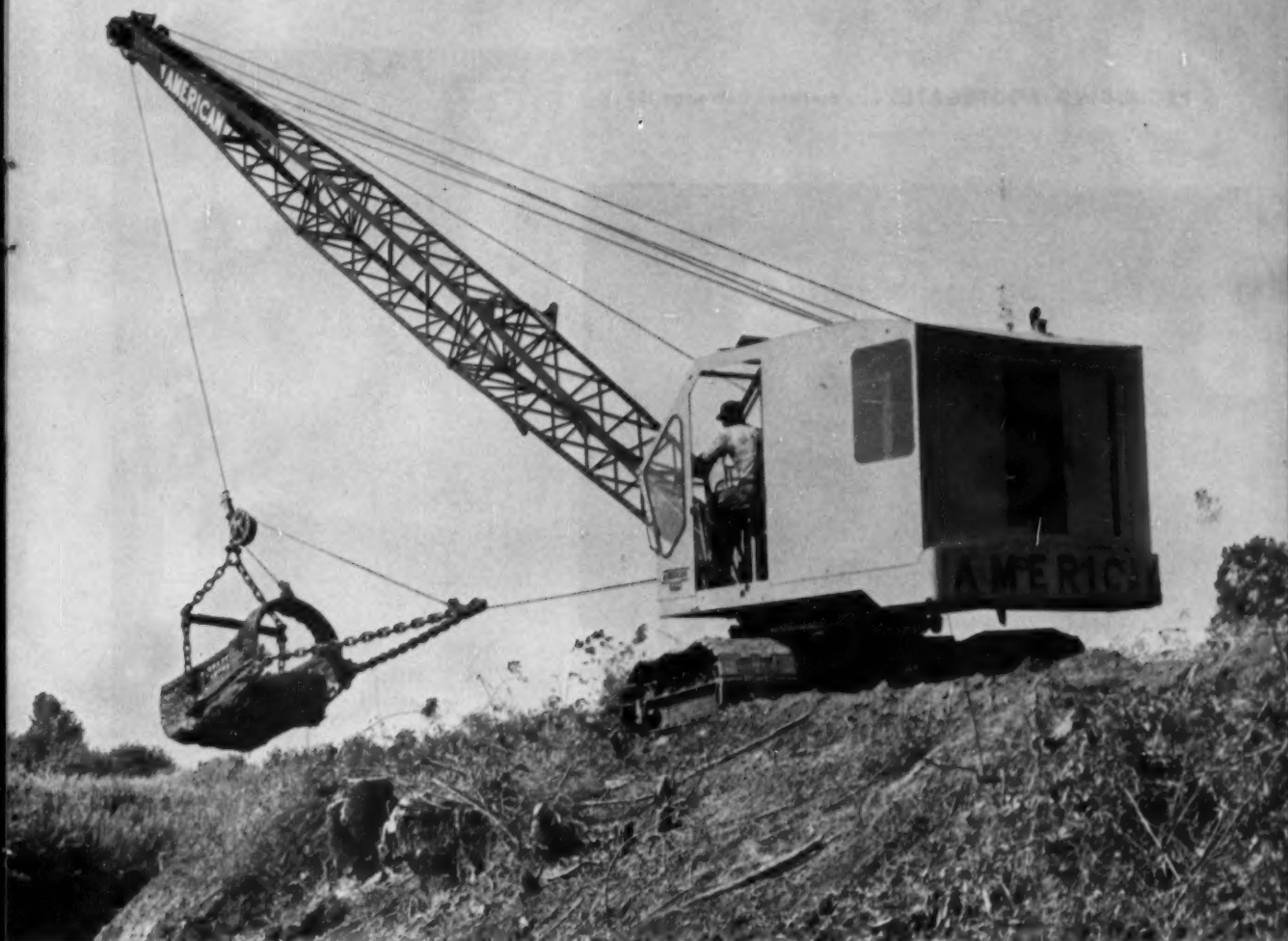
Two new series—five new rubber and crawler mounted models now make a complete line of American Cranes available—bucket capacities from 1/2 to 2-yards, lifting capacities up to 50 tons!

Many basic design features of American's job tested and proved 300 and 700 Series machines are now engineered into the new 1/2-yard and 3/4-yard series. Major features include: a rugged one piece cast steel carbody with integral roller path, bullgear and supporting vertical ribs . . . four improved design hook rollers that result in smoother swings, longer roller and roller path life . . . operator engineered control systems to increase safety, operator efficiency and production rates . . . a high gantry easily raised or lowered without extra manpower plus a power raised, lowered counterweight! The new 100-200 Series, like the well known 300 and 700 Series, offers far greater boom strength at less weight with its new pipe-laced boom now standard on all

American Cranes. Backhoes feature the exclusive adjustable pitch bucket that can be set for maximum digging efficiency at every depth within its range. Spillage, even when truck loading, is drastically reduced! All these, plus many more equally important engineering advances add up to make American Cranes the best buy for top production on every assignment.

Work-ability of these compact, but tough 100 and 200 Series Americans is as amazing as their low initial, low operating costs! These ground hugging crawlers handle any front—work efficiently even on the roughest terrain! On rubber, they roll faster to the job—work faster on the job. They're highly maneuverable and take any front!

You'll find the 100 and 200 Series' wide open machinery deck layout an invitation to frequent, thorough preventive maintenance—an important cost cutting feature.



200 SERIES	MODEL	275 BC	275 BT
	CAPACITY	¾-yard	22½-tons

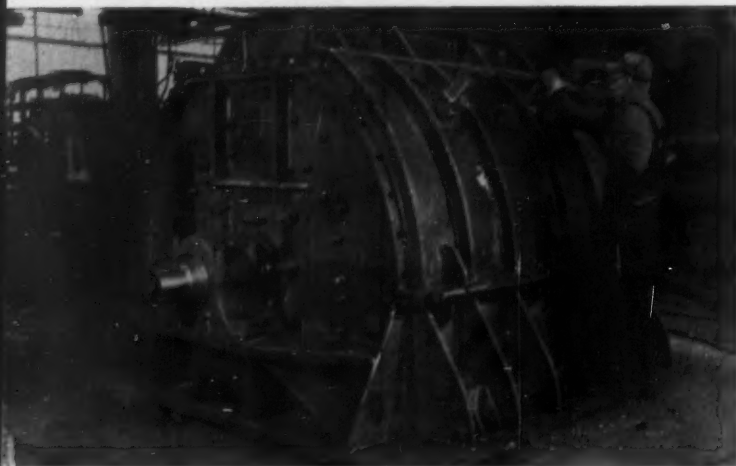
NEW MODELS TO LINE

Designed from the ground up means just that when you're talking about American design. Every machine, 100 through 700, is capacity engineered from the first rough sketches during its design—capacity manufactured through the final stages of its construction! Every part of an American crane has to handle its share of the work load—a weak link means costly down time for you! That's why American engineers capacity-check every part from the smallest bolt to the longest boom. They make sure every part is more than strong enough to handle its share of your job!

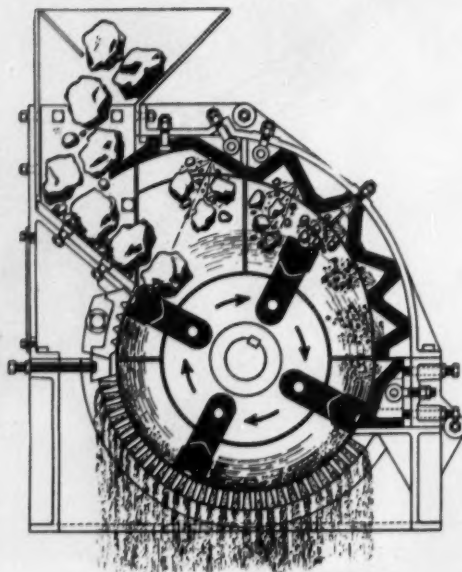
Designing and building quality cranes and hoists is a big part of American Hoist's responsibility to its customers. Another responsibility is to establish a top notch distributor-service organization. American distributors send their service men to factory schools conducted right on the assembly line, not in "class" rooms! Visit your American distributor for the complete story.

AMERICAN HOIST
and Derrick Company

St. Paul 1, Minnesota



HAMMERMILLS crush by combination of impact and attrition. Material entering crusher is struck first by hammers, then finally ground



against lower grate bars until small enough to fall through. Hammermills handle sticky materials. (Rogers and Poor photos)

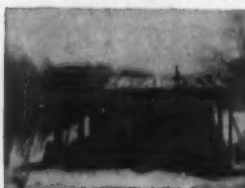
ations in hammermill construction than in almost any other kind of crusher. Hammermills may be one way, reversible, center feed, end feed, etc. Most make provision

for removal of tramp iron. Size of hammermill usually is designated, in inches, by the diameter of the hammers' tip swing and the distance between side faces.

There are many other types of crushers. But, except for occasional uses of the rod mill and the ball mill, they are relatively unimportant in the production of construc-



CMC TRANSCRETES mix and handle any slump concrete better and faster, on any kind of job. Write for new TRANSCRETE BULLETIN.



CMC's large variety of types and sizes of pumps — assure lower cost water handling on any construction job! At left, 10" Dual Primer; at right, SKWEE-GEE diaphragm.



For greater performance . . . lower costs . . . day in and day out . . . it's



Dollar for dollar—feature for feature—CMC construction equipment is your BEST buy! It's backed by close to half a century of manufacturing experience and know how. If you're looking for BIGGER PROFITS—then you're looking for CMC! CONSTRUCTION MACHINERY COMPANY, Waterloo, Iowa.

A COMPLETE LINE OF AMERICA'S FINEST

● TRUCK MIXERS

4 sizes—3½ to 7-yard capacities

● BUILDING MIXERS

from 3½ to 165

● CENTRAL PLANT MIXERS—from 165 to 845

● PLASTER AND MORTAR MIXERS

from 3½ to 12 cubic feet

● PUMPS—Dual Primers from 1" to 10", diaphragms, others.

● HOISTS—Many models. Single, multiple drums to 45 H.P.

When a welded
frame building has
more useable space...

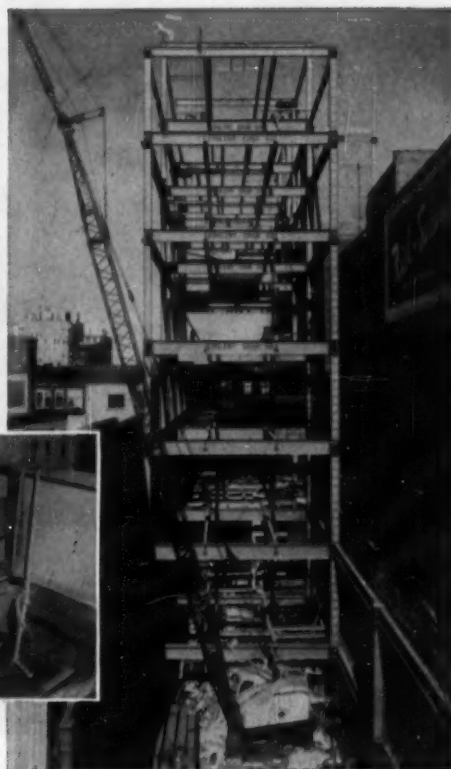
Has far simpler
connections...

Yet uses
less steel...

WHY
don't you design
all buildings
for welded
construction

All-welded 7-story
framework—Width
of structure is only
300 feet with cross
beams connected to
columns in rigid
frame design.

Welding cross beam
web-to-column
flange with Lincoln
Fleetweld 5 using
Lincoln welders. Jet-
weld 2 iron powder
electrodes are used
for downband work.



SAVES \$10 A TON WITH WELDED DESIGN

A REDUCTION in cost of \$10 per ton has been realized through the use of all-welded, rigid frame design on the 7-story Harvey's Department Store in Nashville, Tennessee. The estimated saving results from faster, simpler shop fabrication and detailing over bolted or riveted design.

The welded design used here achieves rigid framing for wind resistance and permits matching of floors in adjacent building without bulky connections normally required with bolting or riveting.

Architects: Marr & Holman, Nashville; Fabricators and Erectors, Englert Engineering Company, Nashville; General Contractor, Sumner Construction Company.

For Studies in Structural Arc Welding write

THE LINCOLN ELECTRIC COMPANY
DEPT. 2712 • CLEVELAND 17, OHIO

Pioneer in Welded Structural Design... for Lower Cost

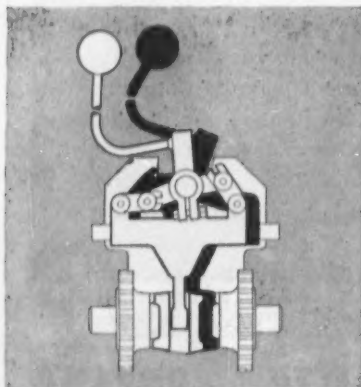
Report from the Dallas-Fort Worth Turnpike Job



"The Allis-Chalmers Forty Five motor grader has the

BEST CONTROLS I'VE EVER TOUCHED"

That's what veteran motor grader operator R. C. Fryer of Telephone, Texas, says about the new mechanical, toggle-type control levers on the Allis-Chalmers Forty Five motor grader he is operating for the J. C. Watson Construction Co., Dallas, Texas.



FORTY FIVE

120 brake hp • 23,800 lb

And here's why Fryer is so enthusiastic. Toggle-type controls move gears into operating position surely, quickly when operator moves lever . . . but with *no* wrist-snapping kick-back. Levers stay put—can't fight back. With no backlash to worry about, Fryer does precision jobs faster and easier.

You've got to see it to believe it

R. C. Fryer is a veteran of the four-mule Fresno days, and his enthusiasm is proof that the Forty Five is motor grader news worth looking into. Check and you'll find toggle-type controls are only one of many features that mean new performance and new operating ease.

The big Allis-Chalmers diesel

engine provides real lugging ability. The **ROLL-AWAY** moldboard rolls the load instead of pushing it . . . moves it faster with less effort. Fully enclosed power steering, new accelerator-decelerator pedal, real operator comfort, excellent visibility, all add up to the kind of production and long-life service you want.

See the Forty Five. Try the Forty Five. Find out for yourself the many advantages that will help you get top performance and big production on your jobs.

Your Allis-Chalmers dealer has complete facilities to serve you—factory-trained sales and service personnel, factory-approved service equipment and complete stocks of True Original Parts.

ROLL-AWAY is an Allis-Chalmers trademark.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



Typical Gyratory Crusher capacities, based on full continuous feed of quarry or mine-run material weighing 100 lb. per cu ft crushed.

STRAIGHT CONCAVES

SIZE OF CRUSHER (INCHES)	TWO FEED OPENINGS APPROX. SIZE OF EACH	COUNTY-SHAFT SPEEDS S.P.M.	APPROX. S.P. REQUIRED	APPROX. NET WEIGHT (POUNDS)	OPEN SIDE SETTING IN INCHES AT DISCHARGE POINT											
					1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
LAB	2 1/2 x 11	700	3	700	1/2											
8	8 1/2 x 35	450	15-25	20,000	20	36	41	47								
10	10 1/2 x 44	400	25-40	30,000	40	50	60									
12	12 1/2 x 44	375	30-75	45,000					65	100	120	135				
16	16 1/2 x 60	350	60-100	62,000							150	160	210			
20	20 x 65	330	75-125	94,000								200	230	280		
24	24 x 98	325	125-175	149,000									310	330	390	
42	42 1/2 x 143	300	200-275	284,000										500	570	630
54	54 1/2 x 170	330	225-300	430,000											675	730
60	60 1/2 x 196	350	225-300	725,000												900
60 SPEC	60 1/2 x 195	350	300-350	1,000,000												1,000

MODIFIED STRAIGHT CONCAVES

SIZE OF CRUSHER (INCHES)	TWO FEED OPENINGS APPROX. SIZE OF EACH	COUNTY-SHAFT SPEEDS S.P.M.	APPROX. S.P. REQUIRED	APPROX. NET WEIGHT (POUNDS)	OPEN SIDE SETTING IN INCHES AT DISCHARGE POINT											
					1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
8	8 x 35	450	15-25	20,000	30	40	45									
10	10 x 44	400	25-40	30,000	54	60	65									
12	12 x 44	375	30-75	45,000				95	112	130						
16	16 x 60	350	60-100	62,000						180	175	195				
20	20 x 65	330	75-125	94,000							185	200	230			
24	24 x 98	325	125-175	149,000								340	370	400		
42	42 x 143	300	200-275	284,000									607	630	690	

NON-CHOKING CONCAVES

SIZE OF CRUSHER (INCHES)	TWO FEED OPENINGS APPROX. SIZE OF EACH	COUNTY-SHAFT SPEEDS S.P.M.	APPROX. S.P. REQUIRED	APPROX. NET WEIGHT (POUNDS)	OPEN SIDE SETTING IN INCHES AT DISCHARGE POINT											
					1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
LABORATORY	2 1/2 x 11	700	3	700	1/2											
8	8 x 35	450	15-25	20,000	30	33	37	43	46							
10	10 x 44	400	25-40	30,000		42	48	51	57	63						
12	12 x 44	375	30-75	45,000					79	87	95	102	109	111		
16	16 1/2 x 60	350	60-100	62,000						107	118	125	136	140	150	
20	20 x 65	330	75-125	94,000							155	163	169	184	199	213
															230	245
																285
																310

Overhead Eccentric, or Single Toggle, Jaw Crushers

Range of Power Required and Average Capacity* in Tons per Hour**

Crusher No. (or size)	Horse Power Required	SETTING OF CRUSHER AT CLOSE OF STROKE											
		3/4"	1"	1 1/4"	1 1/2"	2"	2 1/4"	3"	4"	5"	6"	7"	8"
612	12-15	3	4	6	8	10	14						
810	12-15	2 1/2	3 1/2	5	7	8	12						
918	20-25	5	9	12	15	21	30	45					
1016	15-20	4	8	12	13	19	26	40					
1020	20-30	5	10	15	17	24	33	50					
1024	25-35	6	12	17	20	28	40	60					
1030	30-40	8	15	22	26	36	50	70					
1036	30-40	10	18	25	30	43	60	90					
1524	40-60					43	60	80	100				
1536	60-90					45	65	95	120	150			
1830	60-90						60	75	95	130	150		
2036	70-90							85	130	150	190		
2436	75-100							140	170	200	250	300	
3042	100-130							200	230	300	350	400	
4248	180-210							430	515	600	685	770	855
												940	1025

*Capacities shown may be found to vary as much as $\pm 25\%$, depending on the type of rock.

**Based on material at 2700 lbs. per cubic yard. To find cubic yards of this material, take 74% of values shown in Table.

Capacity and Horsepower — Blake, or swing jaw, crushers

CRUSHER SIZE (IN.)	R.P.M.	JAW MOTION (IN.)	H.P.	CAPACITY IN TONS (2000 LB.) PER HOUR @ OPEN SIDE SETTINGS OF:									
				4"	4 1/2"	5"	5 1/2"	6"	6 1/2"	7"	7 1/2"	8"	9"
36 X 25	210	1-1/8	60-75	200	220	240	250	260	280	290	300		
42 X 32	200	1-3/8	100	250	270	290	310	330	340	360	380	400	
48 X 42	180	1-1/2	125-150			380	400	420	450	470	490	510	540
60 X 48	170	1-7/8	150-250				450	480	500	530	550	570	610

Feed opening, capacity, minimum size of product and horsepower required for typical double impeller impact breakers running at R.P.M.'s indicated.

Horsepower			*Minimum Product Size	Capacities ** (tons) Hr.	Feed Opening
R.P.M.	Electric	Diesel			
300 to 1000	Two 40-50	Two 60-80	1 1/2" minus	50-100 1 1/2" minus	22" x 22"
300 to 1000	Two 60-75	Two 90-115	1 1/2" minus	100-175 1 1/2" minus	30" x 45"
300 to 900	Two 100-125	Two 135-150	1 1/2" minus	150-250 1 1/2" minus	36" x 45"
300 to 675	Two 150	Two 160-175	2" minus	250-400 2 1/2" minus	42" x 50"
300 to 675	Two 150	Two 160-175	2" minus	250-400 2 1/2" minus	42" x 50"
300 to 575	Two 150	Two 160-230	2" to 4" minus	400-600 4" minus	53" x 60"
300 to 575	Two 200	Two 210-230	2" to 4" minus	400-800 4" minus	53" x 60"

* Minimum product size dependent upon type and characteristics of the material processed.

** Capacities dependent upon type and characteristics of the material processed.

PRODUCING AGGREGATES . . .

continued from page 156

tion aggregates. Rod mills and ball mills, which are fine reduction machines, will be discussed in a later section about sand production.

Crusher Selection

When selecting a primary crusher, it is important to give extra consideration to the size of feed and the capacity desired. Efficient operation in the quarry calls for close correlation between primary crusher, shovel, and transportation equipment. Savings are accomplished by blasting to produce the largest sizes that can be handled by the shovels and trucks. This calls for a crusher having a receiving opening large enough to take these large chunks without bridging or blocking.

In gravel pit operations, no particular problem exists regarding the matching of excavating equipment and crusher because the crusher will generally be selected on the basis of capacity. But it may involve casting aside or scalping off boulders too large to enter the crusher selected.

Capacity in pressure type crushers, such as jaw and gyratory, is governed by the crusher setting, which in turn governs the area available for discharge of the material crushed. Capacity of an impact crusher is governed by the speed of the hammers, the power applied, the rate of feed, and the setting of the striker plates or bars. In the single roll crusher, the capacity depends on distance between roll and anvil, and size of feed. In any crusher, the kind and type of material to be crushed will affect the capacity, as will also the method of feeding. Uniform, controlled feed is essential to maximum production.

Such factors as hardness, grain structure, compactability, size and shape of feed, and moisture content of the material all affect the rate of production. Therefore, it is difficult to give absolute figures for capacity of any given type or size of crusher. And crusher manufacturers, in providing tables on crusher capacities, point out that their figures, while the best available, may vary as much as plus or minus 25% from the actual production on any particular job. Nevertheless, the various tables published should be taken as a guide to production.

Continued on next page

Capacity and Horsepower — Single Roll Crushers

Size of Crusher Roll*	Approximate Shipping Weight	SIZE PRODUCTS						Horse Power
		2**	4**	6	8	10	12	
21 x 30	24,874	35-53	76-113	116	154			30-75
21 x 36	26,612	45-68	92-140	140	186			40-100
21 x 42	28,350	53-78	107-163	163	215	230		50-125
21 x 48	30,088	60-90	123-186	186	246	308	326	60-150
21 x 54	32,156	68-101	138-209	209	277	347	418	75-175
24 x 30	36,144	35-53	76-113	116	154			30-75
24 x 36	38,317	45-68	92-140	140	186	230		40-100
24 x 42	40,500	53-78	107-163	163	215	270	326	50-125
24 x 48	42,683	60-90	123-186	186	246	308	372	60-150
24 x 54	44,866	68-101	138-209	209	277	347	418	75-175
30 x 36	53,795	45-68	92-140	140	186	230		40-100
30 x 42	56,330	53-78	107-163	163	215	270	326	50-125
30 x 48	58,865	60-90	123-186	186	246	308	372	60-150
30 x 54	61,500	68-101	138-209	209	277	347	418	75-175
30 x 60	64,868	75-112	154-232	230	308	386	465	100-200
30 x 72	69,891	90-134	184-278	280	370	464	558	150-250
36 x 48	98,535	60-90	123-186	186	246	308	372	60-150
36 x 60	105,815	75-112	154-232	230	308	386	465	100-200
36 x 72	113,091	90-134	184-278	280	370	464	558	150-250

*Roll diameters at base of teeth are always given first. The second figure is roll length.

**The second figures under 2 and 4" products denote capacity when used as a secondary with a ratio of not over 3 to 1 reduction.

Capacities and horse power are based on crushing medium hard limestone, weighing 100 lbs. per cu. ft., when regularly and continuously fed. Size of feed and product, condition and stratification of material, and method of feeding all influence crusher performance.

Capacities of Twin and Triple Roll Crushers—Short Tons (2,000 lbs.) per Hour—Product Passing Square Openings—Crusher in Closed Circuit.
Capacities Are Average and May Vary ±25%, Depending on Kind of Material.

Maximum Size of Product	54x24		40x22		30x24		30x18		24x16	
	Tons	Cubic Yards	Tons	Cubic Yards	Tons	Cubic Yards	Tons	Cubic Yards	Tons	Cubic Yards
1/4"	32*	24	24*	18	21	16	16	12	13	10
3/8"	64	71	48	36	44	33	33	24	26	19
1/2"	96	71	72	54	65	49	49	37	39	29
3/4"	128	95	96	70	88	66	66	49	52	38
1"	160	118	118	87	110	83	82	61	65	48
1 1/4"	192	142	142	106	130	98	98	73	78	58
1 1/2"	224	166	166	125	152	116	116	86	92	68
1 3/4"	256	190	190	141	175	131	131	97	104	77
2"	288	214	214	158	198	148	148	109	117	86
2 1/4"	320	238	238	176	220	166	166	123	132	96
2 1/2"	352	262	262	194	242	182	182	135	146	106
2 3/4"	384	286	286	212	264	198	198	147	160	116
3"	416	310	310	230	286	214	214	159	174	126

In the table above, size of product, and not dimension of crusher opening, is meant.

Tons are based on material weighing 2700 lbs./cu. yd.

The capacity of a roll crusher will depend on the size of product to be produced. To a large extent, the capacity for any given size of product, will depend on the type of roll being used.

*Larger tonnages are possible by feeding graded material evenly over entire roll and by maintaining a low stage of reduction. The feed should be heavy enough to just crowd the rolls but not overload them.

PRODUCING AGGREGATES ... continued

Gradation of Product

When rock and stone are crushed, the product varies all the way from a specific top size to fine dust. Throughout the product there exists a certain gradation of particle size. Such gradation derives its particular characteristic from the mode of crushing. Material crushed by pressure or compression shows a gradation curve different from that shown by a product

Gradation of Product Obtained from Typical Impact Crusher of the Double Rotor Type—Rotors Turning in Same Direction

PRODUCT SIZE	AVERAGE LIMESTONE (Figures noted are percentages of product passing)		
	HAMMER VELOCITY in feet per minute		
	5500	7000	9000
3"	94%	99%	
2 3/4"	93	98	
2 1/2"	92	97	
2 1/4"	91	96	
2"	87	95	99%
1 3/4"	84	94	98
1 1/2"	76	90	97
1 1/4"	67	84	93
1"	54	76	86
3/4"	42	60	74
1/2"	28	46	61
1/4"	15	30	45

Short Head Cone Crushers

Cavities — Feed Openings — Product Sizes — Capacities (closed circuit)

Size	Type of Cavity	Recommended Maximum Discharge Setting	Feed Opening With Minimum Recommended Discharge Setting		Capacities in tons (2000 lb.) per hour at indicated discharge setting							
			Closed side	Open side	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	1 3/4"
2 ft.	Fine	1/2"	1/2"	1 1/2"	5	8	10	14	20			
	Coarse	1/2"	1 1/2"	2 1/2"	8	12	14	20				
3 ft.	Fine	1/2"	1 1/2"	2 1/2"	15	20	25	35	50			
	Coarse	1/2"	2 1/2"	5"	20	30	35	50	70			
4 ft.	Fine	1/2"	1 1/2"	2 1/2"	30	40	50	70	100			
	Coarse	1/2"	2 1/2"	5"	40	60	70	100	150			
	Extra Coarse	1/2"	5"	7 1/2"	50	75	100	150	225	150		
5 ft.	Fine	1/2"	1 1/2"	2 1/2"	60	80	100	150	225	175		
	Coarse	1/2"	2 1/2"	5"	80	120	150	225	350	275		
	Extra Coarse	1/2"	5"	7 1/2"	100	150	200	300	450	375	225	
6 ft.	Fine	1/2"	1 1/2"	2 1/2"	100	150	200	300	450	375		
	Coarse	1/2"	2 1/2"	5"	150	225	300	450	675	525		
	Extra Coarse	1/2"	5"	7 1/2"	200	300	400	600	900	750	450	

Standard Cone Crushers

Cavities — Feed Openings — Product Sizes — Capacities (open circuit)

Size	Type of Cavity	Recommended Maximum Discharge Setting	Feed Opening With Minimum Recommended Discharge Setting		Capacities in tons (2000 lb.) per hour at indicated discharge setting									
			Closed side	Open side	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	1 3/4"	2"	2 1/4"
2 ft.	Fine	1/2"	1/2"	1 1/2"	5	8	10	14	20					
	Coarse	1/2"	1 1/2"	2 1/2"	8	12	14	20						
	Extra Coarse	1/2"	2 1/2"	5"	10	15	20	30	40	50	60			
3 ft.	Fine	1/2"	1 1/2"	2 1/2"	15	20	25	35	50					
	Coarse	1/2"	2 1/2"	5"	20	30	35	50	70					
	Extra Coarse	1/2"	5"	7 1/2"	30	45	50	70	100	120	150			
4 ft.	Fine	1/2"	1 1/2"	2 1/2"	30	40	50	70	100					
	Coarse	1/2"	2 1/2"	5"	40	60	70	100	150	175	225			
	Extra Coarse	1/2"	5"	7 1/2"	50	75	100	150	225	300	375	225		
5 ft.	Fine	1/2"	1 1/2"	2 1/2"	60	80	100	150	225	175				
	Coarse	1/2"	2 1/2"	5"	80	120	150	225	350	275				
	Extra Coarse	1/2"	5"	7 1/2"	100	150	200	300	450	375	225			
6 ft.	Fine	1/2"	1 1/2"	2 1/2"	100	150	200	300	450	375				
	Coarse	1/2"	2 1/2"	5"	150	225	300	450	675	525				
	Extra Coarse	1/2"	5"	7 1/2"	200	300	400	600	900	750	450			
7 ft.	Fine	1/2"	1 1/2"	2 1/2"	150	225	300	450	675	525				
	Coarse	1/2"	2 1/2"	5"	225	338	450	675	1013	788	488			
	Extra Coarse	1/2"	5"	7 1/2"	300	450	600	900	1350	1050	638			

MORETRENCH WELLPOINTS Dewater 22 Acre Site To A Depth of 27 Feet . . . Contractor Removes 1,000,000 Cubic Yards of Earth in 60 Days!



Borrow Pit "C", Winona, Minn. — Pumping Contractor: American Dewatering Corp., Chicago—New York

Johnson Construction Co., Grove City, Minn., estimates that by using wellpoints to predrain this huge borrow pit and by being able to excavate with rubber-tired equipment, they

"Cut in half, at least, the time required to remove the same amount of material using other methods."

Material removed is being used as fill in the construction of Highway 61 between Winona and Homer, Minnesota.

When pumping stops and ground water returns to the site, this pit will become one of Minnesota's famous lakes.

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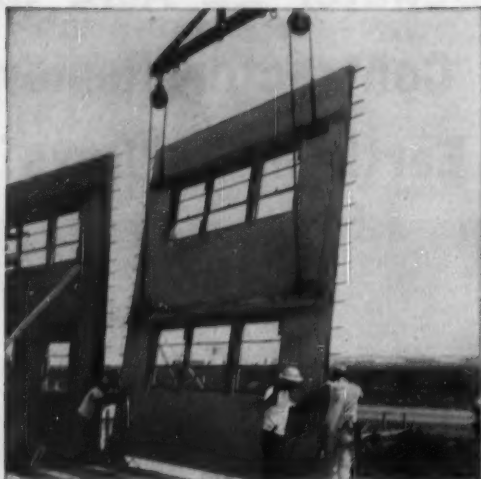
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New Jersey

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

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PANEL with large window areas



WAREHOUSE

DANIEL CONSTRUCTION CO. PHOTO

Tilt-Up Costs Go Down

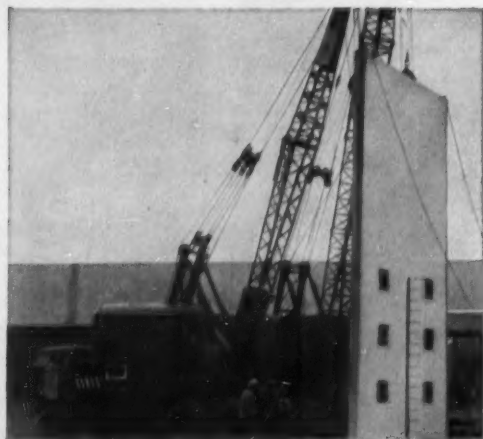
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When an outstanding Tilt-Up job rates an article in a construction publication you can be almost certain that SUPERIOR products were used. The reason is simple. SUPERIOR, as the pioneer in this field, developed designs that were thoroughly tested both in the laboratory and the field to assure safety with economical prices and low application costs.

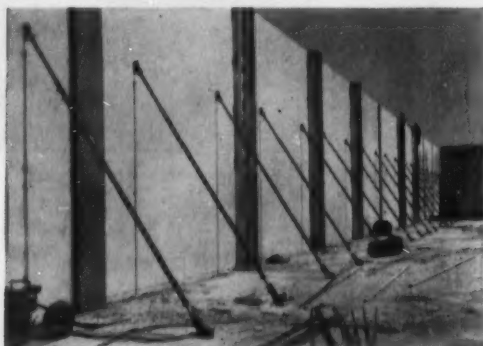
These "Pick-Up" Inserts, Brace Anchors, and Adjustable Braces have been used and proven on literally thousands of projects, not a few of which were unique in design. With a background of such experience, the recommendation of our engineers as to location and types of Inserts and Anchors is reliable and valuable.

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57 TON SLAB being positioned



DANIEL CONSTRUCTION CO. PHOTO

ADJUSTABLE BRACES used for quick and easy alignment of panels

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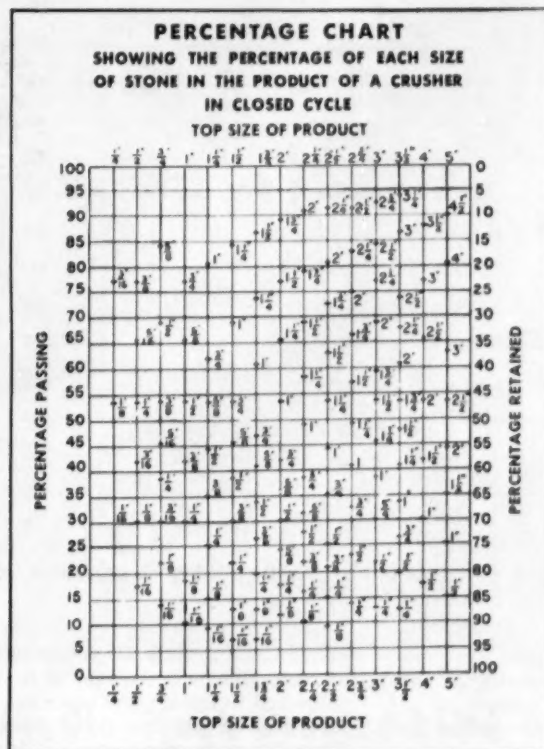
SUPERIOR "PICK-UP" INSERTS ...

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When You Crush Rock

The product of the crusher will consist of stone from the maximum size down to dust. • The following table shows the percentage of each size of stone for various settings of a pressure type crusher.



With a reduction crusher, operating in closed circuit—that is, with oversize screened off and returned to the crusher—it usually is desirable or necessary to know what percentage of the product will fall within any given size range. The chart at the left will be found useful as a guide to such determination.

For example: If you are crushing with the crusher set to produce a top size of 1" material, how much will be $\frac{3}{4}$ " minus and how much will be $\frac{1}{2}$ " minus?

Find 1" at the top of the chart, read down and note that 77% is $\frac{3}{4}$ " minus, and 54% is $\frac{1}{2}$ " minus.

Another example: If you are crushing to produce a top of 1", how much material will be between $\frac{3}{4}$ " and 1", how much $\frac{1}{2}$ " to $\frac{3}{4}$ ", how much $\frac{1}{4}$ " to $\frac{1}{2}$ " and how much will be $\frac{1}{4}$ " minus?

Find 1" at the top of the chart and follow down to $\frac{3}{4}$ " then to $\frac{1}{2}$ " and $\frac{1}{4}$ " and note the percentages. From these percentages you get the results below:

1" to $\frac{3}{4}$ " — 23%..... (100%—77%)
 $\frac{3}{4}$ " to $\frac{1}{2}$ " — 23%..... (77%—54%)
 $\frac{1}{2}$ " to $\frac{1}{4}$ " — 24%..... (54%—30%)
 $\frac{1}{4}$ " minus — 30%..... (30%—0%)

Total... 100%

crushed by impact, shear, or attrition.

Most manufacturers are able to furnish gradation information in chart or tabular form for their machines. Since more aggregates are produced by pressure crushing than by any other method, there are now available gradation charts that can be used as a reference by practically all users of pressure type machines, such as the gyrators, jaw, roll and cone crushers.

Shown above is a gradation chart for material produced in open circuit crushing. It shows the percentage of product passing, and that retained on, a screen of specified size of square opening. This chart allows for an oversize factor of 15% which, experience shows, is about what a jaw or gyratory crusher will produce.

On page 164 is a gradation chart for materials produced in closed circuit. It shows the percentages

of the various sizes in the product after it has all been reduced to pass a given screen opening.

Both charts are useful in setting up the proper equations for design of an adequate crushing and screening plant, hence examples of the use of these charts are included.

Page 160 gives an example of the gradation of the product of an impact breaker of the two-rotor type. Note, in comparison with the values for pressure crushers, that a much higher percentage of the smaller sizes are produced for any given top size.

Crusher Foundations

Primary and reduction crushers are heavy and bulky—they have to resist enormous forces. Therefore, it is important that due consideration be given to the foundation or supporting structure on which a crusher will be installed.

A reinforced concrete foundation should be constructed with the following factors in mind:

- There must be adequate bearing surface between footings and soil to support the weight of crusher and foundation without settling or tilting.
- The foundation must be constructed so that there is adequate space for a conveyor under the crusher (including the by-pass chute, if used). This space should include clearance for cleaning out any spillage that might accumulate around the conveyor.

As pointed out in the chapter on feeders (Part 2 in this series), it is considered good practice to mount the crusher, along with the feeder and power unit, on steel skids so that the whole assembly can be installed on a system of suitable piers.

Continued on next page

PERCENTAGE CHART

Showing the Percentage of Each Size of Stone in the Product of a Pressure Type Crusher*

Example of How to Use the Percentage Chart

No. 1—To determine the amount of 1½ inch material when the crusher is set to produce 2 inch:

Find 2 inch at the top, follow down the vertical line to 1½ inch. The horizontal line shows 56% passing and 44% retained.

No. 2—To determine the amount of ¼ inch minus, ¼ inch to ½ inch, ½ inch to ¾ inch and ¾ inch to 1 inch, when the crusher setting is for one inch material:

Find 1 inch at the top of the chart and follow down to 1 inch, ¾ inch, ½ inch and ¼ inch. The horizontal lines show:

- Passing 1" 85% or 15% over 1"
- Passing ¾" 66% or 19% ¾" to 1"
- Passing ½" 46% or 20% ½" to ¾"
- Passing ¼" 26% or 20% ¼" to ½"

34% is retained on ¼" but 15% is over one inch, so the difference (19%) is between ¾" and 1".

*With crusher set to give 15% recirculation.



To hold down the crusher, anchor bolts obviously will be set into the concrete. The imbedded end of the bolt should be hooked to prevent turning and to afford sufficient anchorage. Anchor bolts must not be drawn too tightly but should be permitted to breathe slightly. One way of assuring this is to insert a flat piece of wood between crusher base and concrete at each bolt hole.

A variation of the above method involves the use of I-beam sections imbedded across the piers to which the crusher base can be secured.

In any event, it is important that the footings extend below frost line.

Safety Devices in Crushers

All crushers, regardless of intended use, have built into them some form of safety device to protect the crusher from damage caused by non-crushable material, such as a dipper tooth, for example.

The protective devices employed in various types of crushers usually are as follows:

Jaw crusher—toggle plate.

Gyratory crusher—shear pin sometimes used.

Roll crusher—springs.

Cone crusher—springs, shear pin, or automatic tripper.

Single roll crusher—spring loaded toggle.

Impact crusher—spring loaded tripper.

Hammermill—tramp iron trap.

Manganese Steel in Crushers

Aggregates crushers, even under the most favorable conditions, are subject to high abrasive wear and considerable shock and impact from movement of the material through them. For this reason, parts that normally come in contact with the rock and stone must have high abrasion and shock resistant characteristics and must be readily replaceable.

In crushers intended for hard, tough crushing, manganese alloyed steel is used to line the crushing chamber and for such parts as mantles, bowl liners, jaw plates, roll shells, and hammers. Crushers intended for soft materials may use manganese steel or, in some cases, chilled or other alloyed steel.

Manganese alloyed steel has the characteristic of work hardening

under impact. It is relatively soft as cast. However, as soon as it is subjected to impact, the outer surface or skin becomes very hard. Thus it resists abrasion. Yet the inner part, or core, remains relatively soft so that it forms a cushion against shock. As the outer surface wears away, a new hard surface is continually being formed. Best manganese alloyed steel for the purpose outlined will contain 11% to 14% manganese with some chrome added.

Impactors and hammermills may at times be equipped with forged steel hammers which stand up fairly well under conditions not too abrasive.

Welding techniques have been developed to build up crusher jaws rolls, and hammers as they wear. Before attempting to build up crushing surfaces, however, consult manufacturers of welding supplies for the correct procedure in any given instance.

The fifth article on Producing Aggregates will appear in our December issue and will discuss screens.

PROOF OF



QUALITY



Versatile, truck mounted LIMA 44 crane speeds freeway construction for Grove, Shepherd, Wilson & Kruge of California, Inc.

This 25-ton Lima Type 44 truck crane is helping to construct the West Coast's largest double deck freeway, at Oakland, California. Owner Grove, Shepherd, Wilson & Kruge of California, Inc., uses it for a variety of heavy duty lifting jobs . . . transferring concrete from truck mixers to hoppers on the bridge deck (shown above); lifting heavy forms, steel and other materials. They report:

"This rugged Lima is tops for the tough assignments that call for a sturdy, dependable machine that stays on the job. It gives us fast, smooth, precise lifts every time. Downtime is no problem, so operating costs are low."

The Lima Type 44's truck mounting pays extra dividends, too. Traveling under its own power, at automotive speeds, the machine gets from job to job *fast*. On the job, the Lima's oscillating tandem type rear axles make it highly mobile off the highway, too . . . and they make for firm working footing on uneven terrain. Grove, Shepherd,

Wilson & Kruge concludes: "The Type 44's fast travel speed and mobility let us use it to serve widely separated jobs quickly and economically."

You, too, can rely on Lima's quality design and construction to insure top service on *your* jobs. These ruggedly built, fast-working machines guarantee you top output at lowest operating cost. Quality pays . . . and Lima quality *pays off for you!* Find out about it from your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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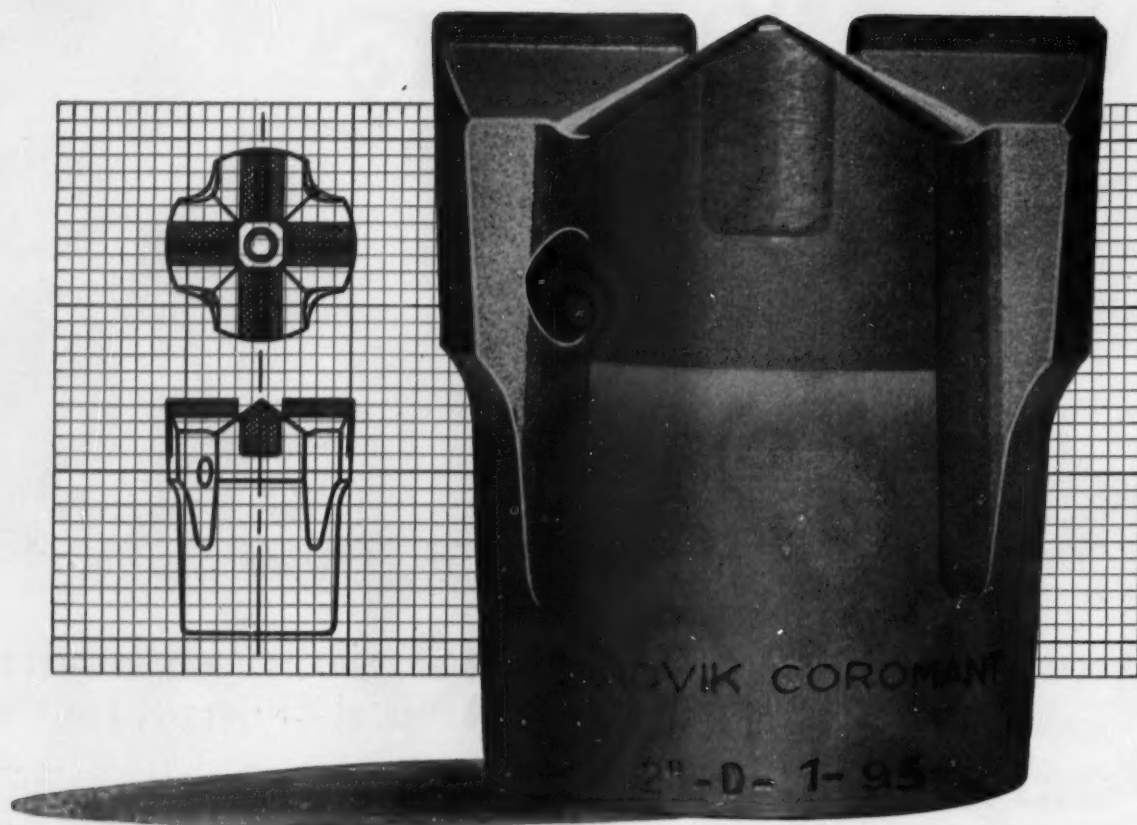
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• THIS ROCK BIT IS PRECISION-MADE FOR A HIGHER PERFORMANCE

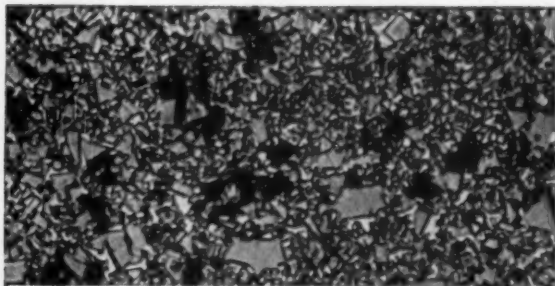


Nothing tougher and more wear-resistant than the insert of a Sandvik Coromant 776 bit

Rock bits that go on *and on* must have highest-grade tungsten-carbide inserts. Nothing but tungsten carbide in its purest state is good enough, will last as long. That's why the carbide that goes into a Sandvik Coromant 776 bit is meticulously controlled.

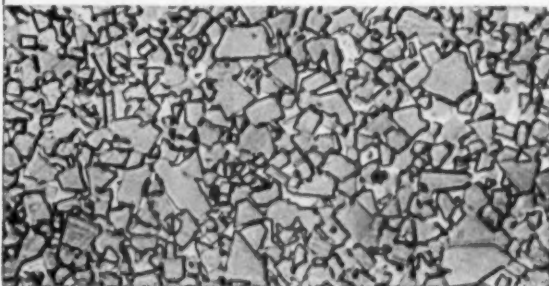
Sandvik, the world's largest manufacturers of brazed-in tungsten-carbide inserts for rock drilling, control every phase of production. Coromant carbide is scrutinised for impurities from the very first stages

of processing the tungsten ore, right through to the final inserts. Add to that Sandvik's special process of securing the insert to the body, employing an exceptionally strong bonding metal, and you know why a Coromant 776 bit lasts longer. In 1955, one billion feet were drilled with these inserts, all fitted to Sandvik Coromant bits or integral steels. *Nothing is more conclusive of the quality of Coromant bits than this figure.*



LOW QUALITY TUNGSTEN CARBIDE

These are unretouched, 1200-times enlarged micro-photos. Above, carbide full of impurities. Those black marks are contaminations which are present when production and quality control are deficient. Contamination of this kind weakens the carbide and reduces its working life.



SANDVIK COROMANT TUNGSTEN CARBIDE

This is Coromant carbide. Notice the uniformity of size and the even distribution of grain. Coromant inserts are free of dangerous porosity and impurities—the reason they go further, have greater strength.

SANDVIK COROMANT 776 BITS

and Sandvik Coromant integral steels are available in standard sizes through Atlas Copco, who, in their own field, are the world's largest manufacturers of rock drills. Contact any of these offices *today* for further information and a demonstration.

Nothing stands the strain like the Swedish body of a Sandvik Coromant bit

When you put the strongest possible tungsten carbide into a rock bit, the body has to be the strongest available to take the extra strain. That's why Coromant bodies are made of high-quality Swedish alloy steel. But that's not all. Inserts and clearance are cylindrically-ground and the insert ends precision-tooled to exactly the same height. This means *smoother* drilling and *smoother* holes, because the load is equally distributed on all four inserts. *Precision engineering such as this give Coromant bits a longer life!*

Nothing fits like the precision-milled threads of a Sandvik Coromant bit

In order to get a smooth profile of the highest accuracy, Coromant threads are precision-milled in a special thread-milling machine and not made with a tap. Precision-milling too protects the skirt from common fatigue failures.



U.S., Atlas Copco Pacific, Inc., 930 Brittan Avenue, San Carlos, California. Atlas Copco Eastern Inc., P.O. Box 2568, Paterson 25, N.J.

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Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment

Lima Crane with Twin Disc Single-Stage Torque Converter "...fastest thing we own" says Ohio Contractor

"I've watched this machine carefully, and it is the fastest thing we own," says Assistant Project Engineer Jack Hickey, of Baker & Hickey, Columbus, Ohio, contracting firm. "This is the smoothest . . . too, especially on pile-driving operations. And I know the torque converter is absorbing those tremendous shocks."

Mr. Hickey is talking about his firm's new Lima Model 44, 25-ton

Crane equipped with one of the new Twin Disc 1500 Series Single-Stage Torque Converters . . . and the underpass and bridge construction work it is doing on the Columbus and Sandusky Expressway.

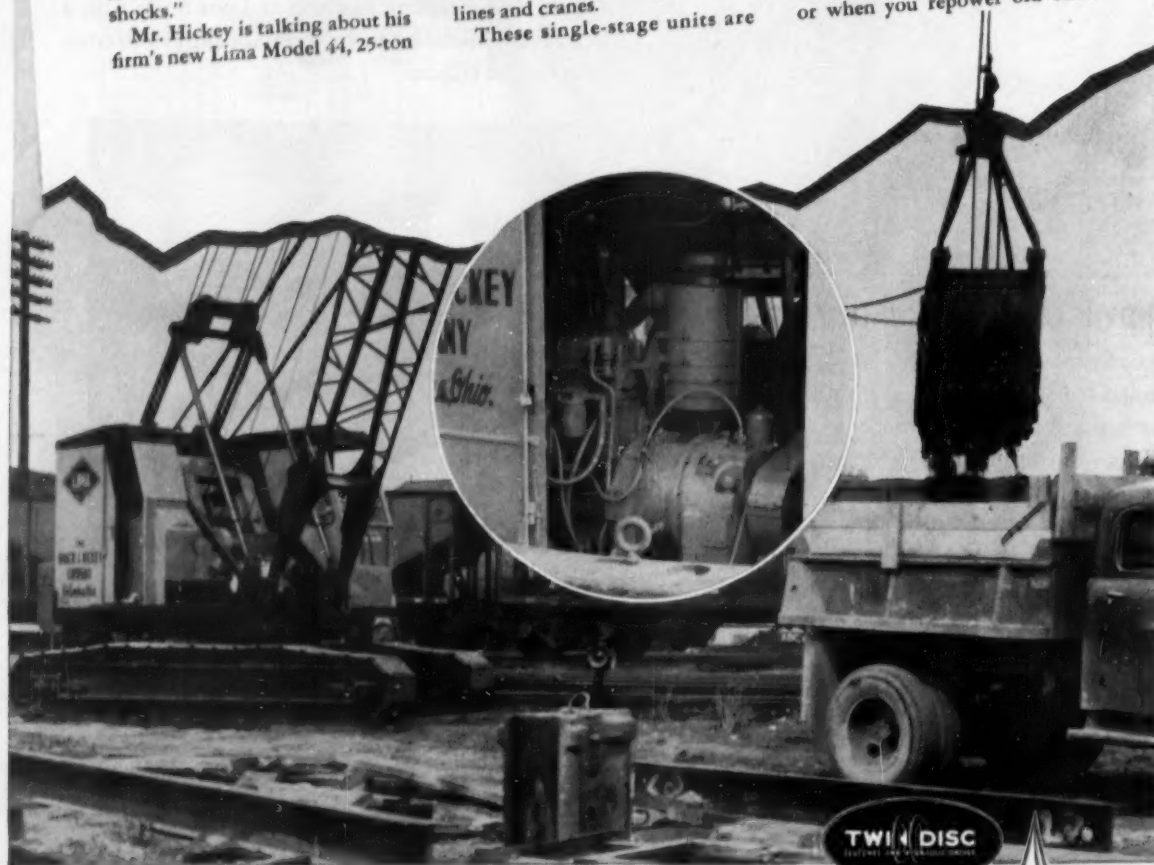
Like Baker & Hickey, more and more contractors are specifying Twin Disc Single-Stage Torque Converters in their shovels, draglines and cranes.

These single-stage units are

designed expressly for just such work. They provide smooth torque multiplication to just the exact ratio required, and permit delicate "inching" or "holding" of loads under power.

Fluid connection cushions out damaging shock loads and vibrations, protecting both driving and driven equipment. The result is reduced maintenance costs, extended cable life, increased profits!

Specify Twin Disc Torque Converters for your new shovels or when you repower old ones.



Write today for full details on Twin Disc Torque Converters — both single-stage and three-stage.

Left, Baker & Hickey's new Lima 25-ton Crane loading with a clamshell bucket at Columbus, Ohio. Inset. Powered by a Cummins JBIS Diesel Engine, the Lima Crane uses a Twin Disc Single-Stage Torque Converter to transmit power smoothly and efficiently.

TWIN DISC
Torque Converters

Twin Disc Clutch Company, Hydraulic Division, Rockford, Illinois

THE SHORTAGE OF SCIENTISTS AND ENGINEERS:

What Can Be Done About It?

There is no easy or quick way to overcome the shortage of scientists and engineers that has become a threat to our national security and economic progress. The solution can come only through diligent efforts extending over several years to bring the supply of technically trained people into balance with our needs. Meanwhile, the pressure of the shortage can be relieved if industry, government and education make better use of the limited number of scientists and engineers now available.

Earlier editorials in this series have discussed the dimensions of the shortage of technical manpower, its meaning for our national security and our economic well-being and the causes of the shortage. This final editorial will survey some of the measures that can be taken to overcome the shortage. Most of the proposals presented here have been suggested elsewhere. But in combination they appear to offer the best hope of an answer to this serious national problem.

Soviet Methods Not For U. S.

It is clear that no crash program, inspired by panic and designed indiscriminately to drive hordes of high school students into science and engineering, is suitable for the United States. Even if we adopted Soviet methods of channeling a large portion of our brightest young people into technical fields, it would be at least four years before results appeared in the volume of college graduates. And such an approach would do no credit to the American way of life.

Any crash program, whether it involved totalitarian methods or simply overselling the advantages of technical careers, would be objectionable for other reasons as well. It would jeopardize the quality of scientific and engineering training. It would put many young people in fields where they have little aptitude and deny them to other fields for which they are better equipped. And, if carried too far, it might even result in the overcrowding that was feared prematurely a few years ago.

The most important problems for the long run, as the preceding editorial in this series indicated, are in the area of education. Any real solution must reduce the loss of talented high school graduates who do not continue their education for financial reasons or because of lack of interest. Also, it must improve the quality of high school preparation in science and mathematics and, above all, relieve the critical shortage of teachers.

Basic Needs in Education

Substantial increases in salaries of teachers in most of the nation's school systems are essential if high school students are to receive adequate preparation for courses in science and engineering. Pay scales that have lagged behind rising living costs and salaries available in industry have placed great strain on even the most devoted teachers. There has been a sharp drop in the number of new graduates trained to teach science and mathematics, and of this smaller number many have decided not to follow careers in teaching.

Raising teachers' salaries to more realistic levels must be primarily the job of local school districts, aided by state governments. If, in face of rapid increases in school enrollments, local and state resources prove insufficient, then federal aid will have to be considered. Higher teachers' salaries, however financed, inevitably mean higher taxes. But without appreciable improvement soon, the quality of our entire educational system is in danger.

At the college level also, financial aid is needed to provide scholarships for promising students and to increase faculty salaries. (An earlier series of editorials dealt more fully with these problems, and business aid to higher educational institutions has been mounting at a gratifying rate.)

But not all the educational problems related to the shortage of scientists and engineers can be solved with money. Science and mathematics have steadily been de-emphasized as more youngsters have gone to high school for terminal education rather

How business is helping to relieve the shortage of technical manpower

Summary of a Survey by McGraw-Hill Correspondents

- Sponsoring summer study programs for high school teachers
- Arranging cooperative work-and-study programs for students
- Sponsoring college fellowships and scholarships in science and engineering
- Paying tuition of employees taking science and engineering courses
- Keeping college faculties abreast of new developments in industry
- Hiring high school science teachers for summer and part-time work
- Giving old, but usable, laboratory equipment to schools
- Cooperating in high school science exhibits
- Sponsoring regional science fairs
- Sending speakers and training aids to schools
- Opening plants for student tours
- Analyzing jobs to relieve engineers and scientists of routine work

The McGraw-Hill Department of Economics will be glad to hear of any other ways business is helping relieve the shortage.

than for college preparation. This de-emphasis must be reversed.

Techniques of instruction, furthermore, can stand improvement at all levels of education. Professor E. P. Northrup of the University of Chicago observes: "In the past fifty years . . . there has been a revolutionary change in the character of mathematics, yet not a trace of this change is to be found in the curricula of all but a handful of secondary schools throughout the country." Colleges and universities may have to examine old fetishes about light teaching loads and small classes in order to make more efficient use of their faculties.

What Industry Can Do

Industry has the immediate problem of better utilization of available technical manpower and the long-range responsibility of helping increase our resources of trained people. Frantic recruiting practices and reckless bidding up of starting salaries—financed largely by government money for defense orders—are not the answer. There is need for earnest consideration of incentives for experienced scientists and engineers, who too often must look to sales or executive positions for adequate financial recognition.

Industry in many instances could make more efficient use of engineers and scientists by shifting work to technicians, clerical personnel and even machines. One company found that 15% of the time of an engineering design group was spent on routine jobs and that this valuable time could be saved by adding a technician and a clerical worker to the group.

Other potential sources of technical manpower could be tapped more extensively to relieve the shortage. Very few women have entered what has been traditionally a man's world. Negroes are only slowly gaining educational and employment opportunities in technical fields. And many experienced older men can still give useful service.

A Good Beginning

Much is being accomplished already in efforts to attract more young people into scientific and engineering careers. A summary of some of the things business is doing is presented above. Other notable contributions are being made by such organizations as the professional engineering and scientific societies (especially through their manpower commissions), the National Science Foundation, the National Research Council, the National Education Association, the National Merit Scholarship Foundation and the Thomas Alva Edison Foundation.

Results are beginning to appear in rising enrollments in engineering schools and technical institutes. Between 1951 and last year, according to McGraw-Hill's annual survey of technical institutes, enrollments in these schools rose from 46,000 to a record 67,000. Engineering enrollments rose in the same period from 166,000 to 243,000. A rising tide of graduates is already being made available to American industry.

This is a good beginning. But only with wider appreciation of the serious implications of the shortage of scientists and engineers and intensified efforts on the part of business, government and education to relieve the shortage can we hope to overcome this threat to our national security and economic well-being.

This is one of a series of editorials prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.



Have you seen the brand-new C Tournapull with increased-capacity "Fullpak" scraper? It's lower, wider, better-than-ever! Loads faster, boils easier . . . heaps 18-yd. pay-loads for more profitable dirtmoving. Ask for details.

Leading from ledge, Tournapull-Tournatractor team speeds dirtmoving operations on 90-acre housing project. Contractor E. R. Fenwick found one Tournatractor sufficient to push-load his 3 high-capacity "C's", and keep them busy moving wet, red shale.

Level 90,000 yds. of red shale for future 400-home subdivision

To cut and fill a hilly 90-acre site in preparation for the erection of 400 homes, Everett R. Fenwick of Matawan, N.J., employed 3 C Tournapulls to haul dirt . . . and a dozer-equipped Tournatractor to push-load the "C's" and handle clean-up.

This project, known as Roosevelt Park Housing Development, at Woodbridge, N.J., is being built by Sommer Brothers of Iselin, N.J.—who hired Fenwick for the 90,000-yd. cut-and-fill work. Material was red shale . . . heavy, difficult to load, and wet.

Average pay-load of high void shale picked up by Tournapulls was 10 cu. yds. On a round trip distance of 816' cycle-time was 3 min. 5 sec., average. "Pulls" had to climb a 15% grade on return trip. Because of scattered areas of cut and fill, no haul-road, as such, was possible. "C's" had constantly rough hauls.

"Tops for big jobs"

"C Tournapulls are tops for big earthmoving work", Fenwick said. "I also have two D Tournapulls, which I use on smaller assignments. The combination of the two makes it possible for me to handle any type of earthmoving job with confidence."

"My Tournatractor has also proven itself to me by solid performance and utmost economy on many projects," he added.

Tournapulls can help you

You may have a job similar to those successfully handled by this New Jersey contractor. If so, you can benefit from Tournapull's rubber-tired mobility and easy to handle electric-control system. Let us show you owner-verified facts on Tournapull and Tournatractor performance. There's a size and type machine to do *your* job in less time, at bigger profit!



C Tournapull loads fast, packs big yardage in bowl. Dozer-equipped Tournatractor has power and speed to push-load "C" fast.



C Tournapull spreads load, then uses 90° power-steer to swing around in turn leaving fill. Maneuverable "C's" work handily in narrow spaces . . . ride smoothly.

Fullpak—Trademark, Tournapull, Tournatractor—
—Trademark Reg. U.S. Pat. Off. P-1004-B-b




LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



*Union Tufwire provides mighty
tendons of strength in*

NATION'S LONGEST PRESTRESSED CONCRETE GIRDERS

146 feet long, the precast, prestressed concrete girders framing the roof of the new Parkview High School Gymnasium (Springfield, Mo.) are believed to be the longest ever constructed in this country.

12 Tufwire high tensile wires (0.250" dia.) form the prestressing strands. There are 16 strands in each girder. These Tufwire high tensile wires have an ultimate strength of 240,000 psi, making possible the high compressive stress built into the concrete by prestressing.

One of the giant girders approaches the top of the columns. While it awaits connection to the columns, the girder is supported by a 132-pound steel rail inserted through holes at the sides of the columns.

The giant girders are supported on unique twin concrete columns, and tied to them by prestressed rigid joints. The girders were cast and prestressed on the concrete floor of the gymnasium, and hoisted atop the columns by the same hydraulic jacks used for prestressing. Then strands providing the continuity of the joint between girder and columns were placed and stressed.

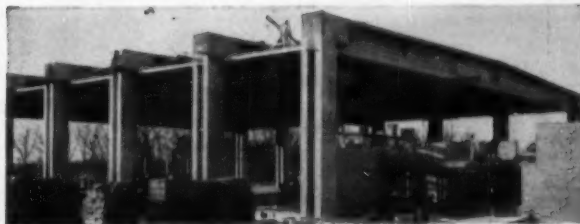
This new building impressively points up the advantages of prestressed concrete construction: longer spans, greater strength-to-weight ratio, lighter foundations and substantial savings in building time and costs.

Union Wire Rope Corporation's advances in developing better high tensile wire and strand helped open the way for the present trend to prestressed construction. Today we're supplying Tufwire Stress-Relieved Wire and strand for projects ranging from the world's longest highway bridge (over Lake Pontchartrain, Louisiana) and the nation's biggest highway-building program...right on down to light poles and farmers' fence posts. The jobs don't come too big or too small!

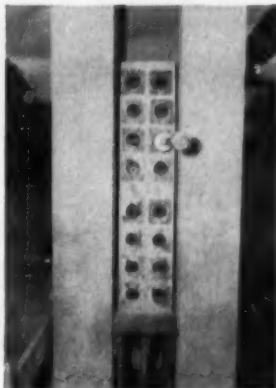
CERTAIN SUPPLY — PROMPT DELIVERY

That's what you're assured when you specify Union Tufwire wire and strand. The research and production facilities of Union Wire Rope Corporation have been geared to the seven-league strides of prestressed construction since the trend began shaping up a decade ago. Our expanding plant capacity and Mid-America location mean prompt service for your order.

Have a problem? Whether you're an on-site contractor or a permanent casting-bed operator—or want to explore the advantages of prestressed concrete in your field—get in touch with our engineering department and research laboratories. We'll gladly lend a lift with any prestressing problem.



Precast channel roof slabs rest on the lower flanges of the girders, providing a smooth ceiling inside the building. You can see in this picture how continuity stressing rigidly holds columns and girders together.



The 16 prestressing strands are shown in position in the girder ready for post tensioning. The girders are seven feet deep at center, tapering to 5.5 feet deep at each end.



Holes formed by rubber cores in the end block receive the Tufwire strands with which the girder is joined to the top of the column by post tensioning.



Tufwire in coils ready for placing in the girder after removal of forms.



Get this booklet now!

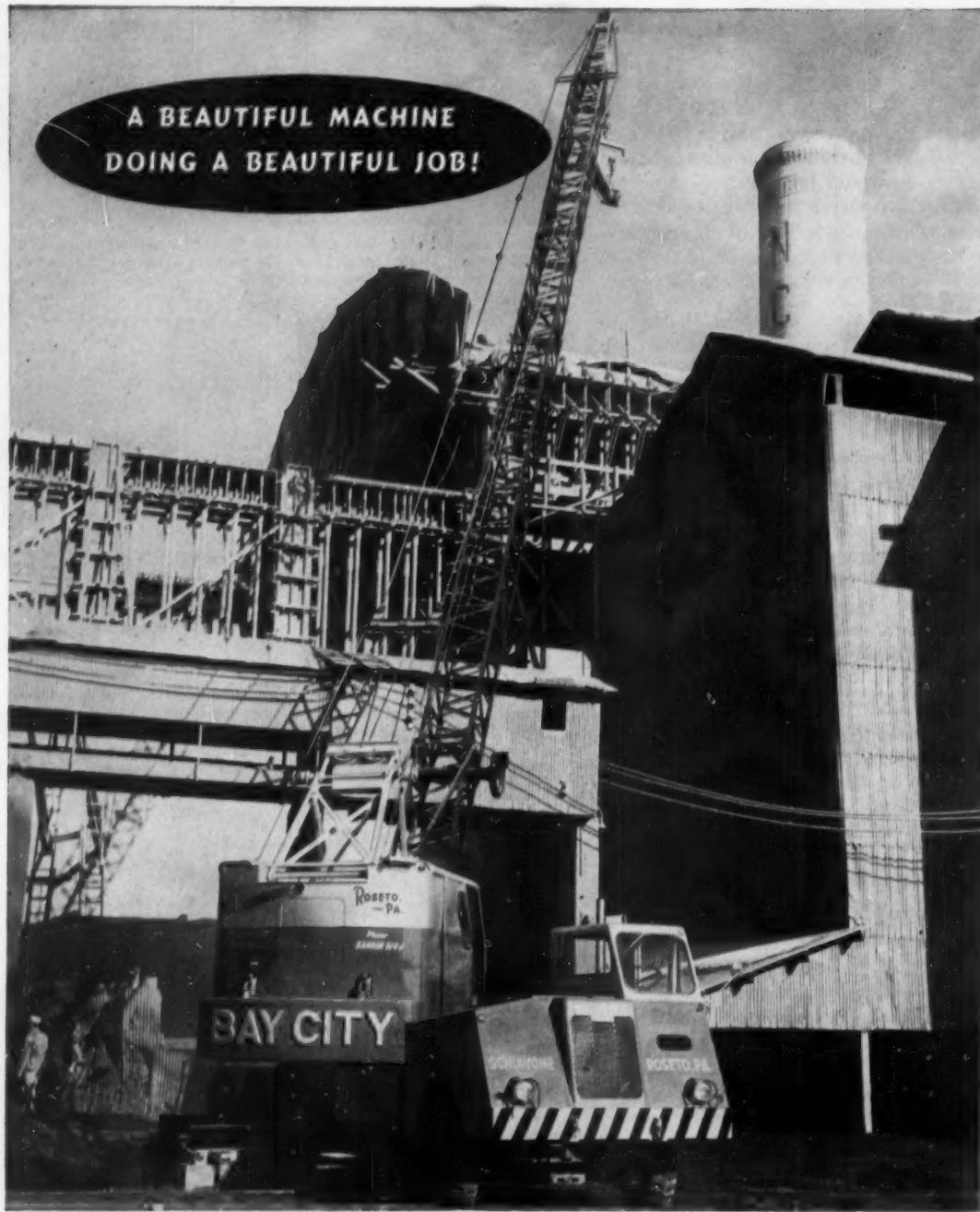
It's a comprehensive handbook that gives you important facts about prestressed concrete. Plus complete specifications and data on Tufwire as used in both pretensioned and post-tensioned prestressing. No charge.



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Specialists in high-carbon wire, wire rope, braided wire fabric, stress-relieved wire and strand.
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A BEAUTIFUL MACHINE
DOING A BEAUTIFUL JOB!



**BAY CITY 25 TON CRANEMOBILE TAKES
CONCRETE 105 FEET UP!**

Equipped with 105 feet of boom, this BAY CITY 25 ton CraneMobile is placing concrete on a fast, smooth cycle in Nazareth, Pa. The CraneMobile will raise maximum boom from horizontal without help from another crane. An independent worm boom hoist raises and lowers boom or boom and load through reversing clutches under power, thus giving complete control of boom operations at all times. This highly mobile, rubber-tired BAY CITY is available in a range of capacities up to 25 tons, and in a selection of carriers to fit the job. High Gantry collapses for travelling to 11'-8" overall height and the pin-connected boom requires little time for boom length changes. Write today for your CraneMobile catalog or see your nearest dealer.

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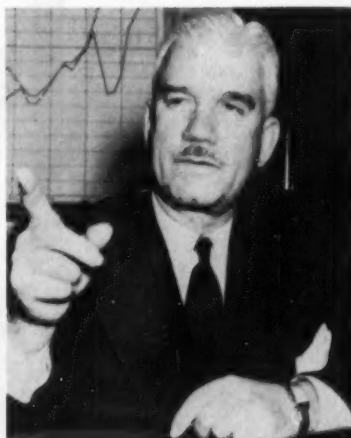
BAY CITY

SHOVELS • CRANES • HOES
DRAGLINES • CLAMSHELLS



261

Construction Men in the News . . .



THOMAS M. LIVELY, consulting safety engineer of Minneapolis, Minn., and WENDELL R. BLAIR of the National Safety Council have formed the partnership of Lively-Blair and Associates, consulting safety engineers for the construction industry. Blair has for the last two years been staff representative and senior engineer of the Construction Section of the National Safety Council. Prior to that he was construction safety engineer for a large insurance company. Lively also was a consultant.

Name Federal Highway Chiefs

JOHN A. VOLPE (left), president of the John A. Volpe Construction Co. of Malden, Mass., is President Eisenhower's interim administrator for the nation's new multi-billion dollar highway program.

BERTRAM A. TALLAMY, now chairman of the New York Thruway Authority, was nominated by the President to take over the important post in January—subject to Senate confirmation.

The key sub-cabinet post was created with passage last June of the Federal Highway Act of 1956. It will have direct responsibility for the biggest public works project in history.

Volpe, for the last three years, had been serving as Commissioner of the Massachusetts Department of Public Works. He resigned recently to return to private business.

"At the request of the President, however," said Secretary of Commerce Sinclair Weeks, "he agreed to defer his return to business until Mr. Tallamy is free to take over at the beginning of next year."

Volpe has packed a lifetime of professional and civic activity into the last 20 years. Starting with \$300 capital in 1934, he built up one of the nation's most successful construction businesses. His firm has handled jobs over a wide area of the U.S. and in Italy. Its activities have ranged from small structures to big highway jobs.

Massachusetts Governor Christian A. Herter appointed him Com-

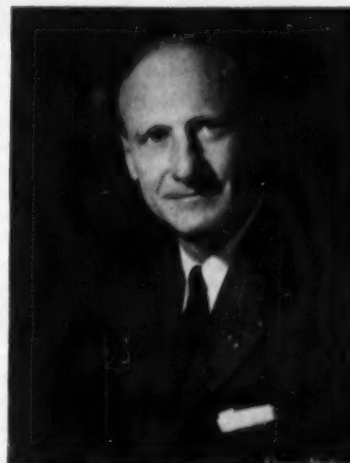
missioner of Public Works in 1953. During his three-year term of office, he directed construction of the Massachusetts Turnpike and reconstruction of Route 128 circling Boston.

In February, 1943, he closed his business and joined the Navy's Civil Engineer Corps. He served three years and was released from active duty as a Lt. Commander, U.S.N.R.

Tallamy, who will replace Volpe in the post in January, was described by Secretary Weeks as the "best qualified man to handle this all-time record road program."

"Tallamy," Weeks said, "is famed for engineering know-how and business executive competence. He has also the priceless experience of many years as the Superintendent of Public Works of New York State. His unique combination of talents assures full understanding of government-industry highway practices and proved experience in cooperation with state highway officials."

Tallamy was elected a member of the executive committee of the American Association of State Highway Officials in 1948. He became first vice-president in 1950, and President in 1951. He is a member of the American Society of Civil Engineers, Albany Society of Engineers, New York Association of Highway Engineers, the Society of American Military Engineers, and the National Society of Professional Engineers.



COL. MASON C. PRICHARD is a new vice-president of the Oman Construction Co., Nashville, Tenn. He was for the last two years executive vice-president of the Foundation Co., of New York.

A native of Mobile, Colo. Col. Prichard was engaged for a number of years in public and private projects before beginning a long association with the U.S. Army Corps of Engineers. During World War II, he was a Colonel, serving as chief of construction at Headquarters, Army Service Forces, in the Western Pacific. Before returning to private practice, he was with the Army again for several years as special assistant on military construction to the Corps of Engineers.

He is a member of the Board of Directors of the American Society of Civil Engineers. He formerly was president of the Capital section of the society.

(Continued on next page)

Compare

these extra LaCrosse values
for yourself!



Quality Points	LaCrosse 10-ton tilt	Competitive 10-ton tilt
Drawbar channel	10"	7"
Main beams	8" channel	$\frac{3}{8}$ " formed plate
Wing members	4" channel	$\frac{1}{8}$ " formed plate
Side members	8" channel	$2\frac{1}{4}$ " x 2" x $\frac{3}{8}$ " angle
Front stringer	8" channel	6" channel
Rear stringer	6" channel	7" box sec. $\frac{3}{8}$ " plate
Deck width	96"	92 $\frac{1}{2}$ "
Deck length	17'	14' 5 $\frac{1}{4}$ "
Tire size	1000 x 15" 14-ply	825 x 15" 14-ply
Wide base rims	Yes	No
Brakes	12 $\frac{1}{4}$ " x 6" (Air or Vac.)	13" x 3" (Electric)
Hydraulic "cushion tilt"	Yes	No
Towing lunette	Adjustable	Stationary
Lights	Standard	None
Weight	4300 lbs.	2800 lbs.

If you could see a LaCrosse Model TSA2-10 trailer alongside several 10-ton capacity single-axle tilt-trailers, there would be little question as to which unit you would choose. But since you seldom have a chance to judge competitive trailers side-by-side, we felt this typical COMPARISON CHART would be helpful in appraising the extra performance features you get with LaCrosse Tilt Trailers.

As you can see in the above chart, the LaCrosse TSA2-10 is built for more rugged than its "10-ton-rated" competitor. The TSA2-10 also has a wider, longer deck... bigger tires... bigger, more powerful brakes... plus a hydraulic tilt mechanism that "cushions" shock loads.

Adjustable towing lunette and ICC-approved lights are standard equipment.

Consider, too, these additional "hidden benefits" of LaCrosse quality-controlled production: Special frame positioners for stronger welds... shot blasting and undercoating for longer trailer life... custom-built axles, plus replaceable brake spiders for greater axle economy... fast parts service anywhere, anytime.

The superior performance of LaCrosse tilt decks and low-bed trailers, up to 75-ton capacity, has been pre-proved by millions of miles of owner use. Why be satisfied with anything else for your hauling requirements? Write for details. LaCrosse Trailer Corp., LaCrosse, Wis.

LC-36

"Better Living Through Better Roads"



LaCROSSE

VALUE LEADER IN LOW-BED TRAILERS

CONSTRUCTION MEN IN THE NEWS... continued



BRIG. GEN. B. B. TALLEY, recently retired from the Army Corps of Engineers, joins Raymond Concrete Pile Co. as a project manager on foreign construction operations.

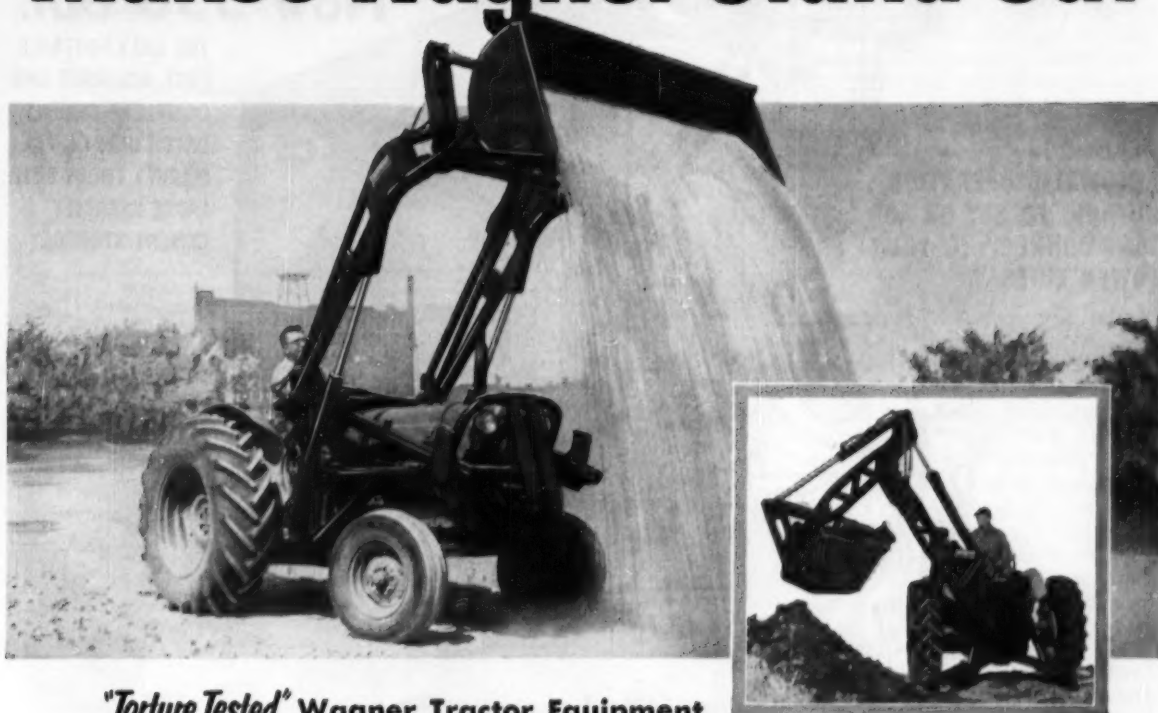
Gen. Talley was for the past year Division Engineer, Mediterranean Division, Corps of Engineers, with headquarters in French Morocco. He was in charge of construction of Air Force bases in North Africa and the Middle East. Before that he was Division Engineer, North Atlantic Division, with headquarters in New York.

For nearly 10 years he worked on the development of mapping and surveying by aerial photographs. Methods that he and his associates developed furnished allied armies with accurate fire control maps from in France and Germany during World War II.

He is a member of the American Society of Civil Engineers, Society of American Military Engineers, Military Order of the World Wars, and The Moles.

MASON G. LOCKWOOD, Houston consulting engineer, is the new president of the 39,000-member American Society of Civil Engineers. Lockwood will be installed this month at the society's national convention in Pittsburgh. He succeeds ENOCH R. NEEDLES of New York in the post. FRANCIS S. FRIEL of Philadelphia, and NORMAN R. MOORE of Vicksburg, Miss., are the new vice-presidents.

Ruggedness Built In Makes Wagner Stand Out



"Torture Tested" Wagner Tractor Equipment

Gives Longer Life — Reduces Down-Time and Repair Cost

Rugged work requires rugged equipment and that's exactly what you get with Wagner "Torture Tested" tractor equipment. Every stress point is *doubly* protected. Heavy-duty construction keeps maintenance costs way down and productive time way up. Wagner equipment stays on the job day in and day out working for you and more profits. No wonder Wagner tractor equipment is recog-

nized as so far superior it has become No. 1 in America by a wide, wide margin. See all the rugged features of Wagner tractor equipment and the numerous attachments that can make a tractor your most versatile piece of equipment. Get proven dependability no matter how tough the job. Get Wagner tractor equipment today.

wagner

TRACTOR EQUIPMENT

WAGNER IRON WORKS, 1905 South 1st St., Dept. 118
Milwaukee 1, Wis.

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for a tractor.
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"WAGNER BUILT" MEANS "BETTER BUILT" FOR OVER 105 YEARS

Weighmeister Screw-Action Batch Lift

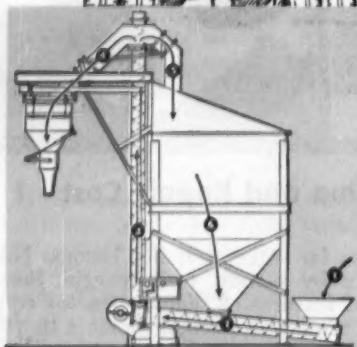
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PROVIDES SAVINGS IN
WEIGHT, INITIAL COST

Now 350 bbl.

THE ONLY PORTABLE
FAST, ACCURATE AND
COMPLETE CEMENT
BATCH UNIT ON THE
MARKET TODAY WITH
LARGE CAPACITY
CEMENT STORAGE

READY FOR
AUTOMATIC OPERATION,
NOTHING TO BUY OR ADD,
JUST CONNECT TO YOUR
POWER LINES



① Bulk cement is delivered at track site or from truck at ground level. ② Feeder screw delivers to Weighmeister's vertical screw. ③ High-capacity vertical screw lifts cement to ④ precision batcher, which dumps either automatically or at operator's control. ⑤ When pre-set weight is reached, flow automatically shifts to storage bin. ⑥ Between bulk deliveries, cement flows by gravity from storage bin to feeder screw. Controls can be set to stop feeder and vertical screws automatically, if desired, when weight is reached.

* Now Proven!

- 1 **PORTABLE**—Sets up on a single truck. All air and electric lines have plug-in type connections.
- 2 **VERSATILE**—Can be used as a transfer plant, batch plant with railroad or truck unloading.
- 3 **FAST AND ACCURATE**—Precision-fed batcher, automatic controls constantly give uniform mixes.
- 4 **RUGGED**—Built to withstand constant moving.

*After 20 months of continuous service the pilot unit showed no signs of wear, required minimum maintenance, and had no down-time for repair!



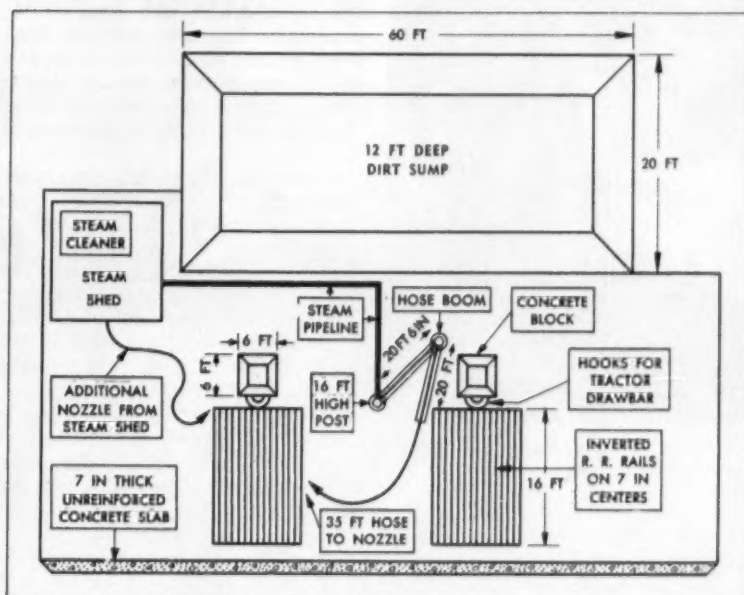
Burmeister

COMPLETE PLANTS FROM A SINGLE SOURCE

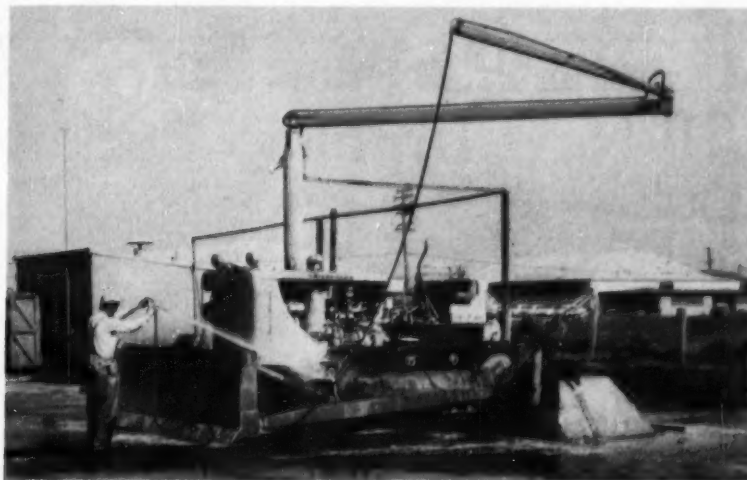
WRITE FOR FULL DETAILS

Write or call for complete information. We will be happy to answer your questions . . . without obligation. L. BURMEISTER COMPANY, 4541 W. Mitchell Street, Milwaukee, Wis.

The Maintenance Shop . . .



EQUIPMENT IS CLEANED over railroad rails set in 7-in. concrete slab that slopes to unlined sump. Cleaner is housed in shack at left. Pipe forms most of line from shack.



BOOM PERMITS operator to move around big rigs, keeps most hose off ground. To clean track assemblies, rig is held by block as tracks spin on rails to reveal each link.

Steam Cleaning Area Makes Job Routine

EQUIPMENT CLEANING is an easily handled, routine operation for Peterson Tractor & Equipment Co., thanks to the well-planned steam cleaning plant it operates at its San Leandro, Calif., shop.

When a rig comes into Peterson's shop for major repairs or for an overhaul, it is thoroughly cleaned before the mechanics get to work on it. "Our mechanics like to work on a clean rig, and when you send a clean machine back to the customer his operators are more likely to treat it like a new rig," says R. A. Peterson, vice president of the large West Coast distributorship.

To reduce what was a time consuming and dirty job to a routine operation, Peterson decided to make the steam cleaning area a permanent, well-equipped part of the shop.

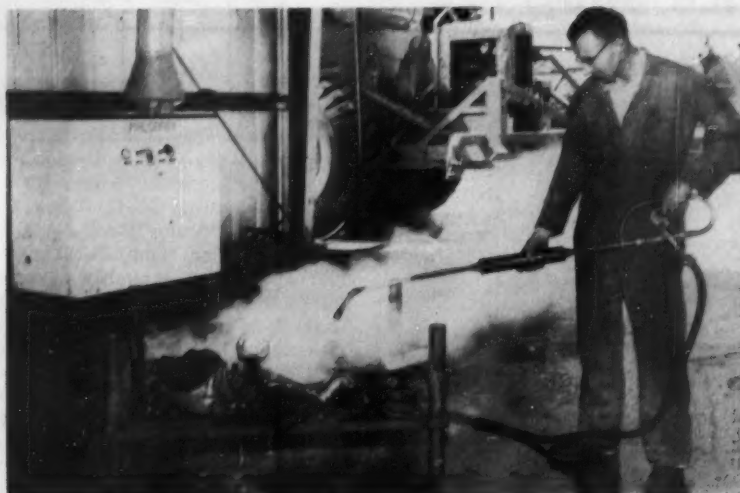
All equipment is cleaned on a 7 in. thick unreinforced concrete slab located at the rear of a large outdoor storage area. This slab is sloped slightly so that water runs off rapidly into a 12-ft deep sump. After a rig is cleaned, mud and dirt can be hosed quickly into this sump. Since the sump is unlined, cleaning liquids drain into the ground. Once a year or so, the muck is cleaned out by a dragline.

A Malsbury 500 HPC cleaner housed in a corrugated steel shack at one end of the cleaning slab powers two guns. Besides protecting the cleaner, the shack serves as a storage area for solutions and other equipment used in the cleaning operation.

A shop-built, overhead jointed boom that is set conveniently between two cleaning positions makes it easy to move the gun around the biggest rigs. The 16-ft high boom also reduces hose wear because it keeps it off the slab, reduces abrasive wear from dragging, and permits permanent pipe to be used instead of rubber hose for the greater part of the line. The entire line, except for a 35-ft hose from the end of the boom to the gun, is formed with pipe.

At the cleaning area two sets of 16-ft long railroad rails are set into the concrete slab flush with the surface. These are inverted and spaced on 7-in. centers so that they form a steel platform that will not be damaged by crawler equipment.

In front of the rails, two 6x6x3-ft concrete blocks are cast into the



MECHANIC USES a new type gun that permits him to stop or start solution instantly to clean parts from rig being overhauled. Gun allows cleaner to be used for varied jobs.

slab. These blocks have heavy-duty swivel hooks bolted to them. When a crawler tractor is being cleaned it is attached to the hooks by its draw-bar and the tracks are allowed to spin slowly on the inverted railroad rails. This makes it

an easy task to wash dirt from the track plates and links.

The Malsbury 500 HPC cleaner is a high-capacity unit that creates blasts up to 400 psi. It will deliver high pressure hot solution at 325 deg F, high pressure cold water,

high pressure hot water at 200 deg F, low pressure wet steam, and low pressure warm water. Because the cleaner operates two guns simultaneously, one man can use high pressure hot solution to soften and blast away greases, tars, or corrosive oils while the other man rinses the rig with high pressure cold water.

Generally, Peterson's men pre-soak oil or grease accumulations with a diesel oil emulsion spray. This loosens the dirt so that it usually can be blasted away by high pressure hot or cold water, thus saving chemicals and time.

Peterson recently added two 250 HPC cleaners to its maintenance shop. These are used by shop mechanics for cleaning parts when a rig is overhauled or when used equipment is rebuilt. They are equipped with guns that allow the operator to introduce solution instantly at the nozzle without adjusting the cleaning plant. This feature is a time saver when a number of men use the same cleaner on various jobs, and at Peterson's shop each mechanic steam cleans his own work.

Increase Dragline Efficiency with Bucyrus-Erie All-New Dragline Buckets

New concepts in design plus a special new light-weight alloy in Bucyrus-Erie dragline buckets offer you new efficiency in dragline operation. Look at these outstanding advantages:

Easy Loading—A "slicing-action" lip rapidly penetrates even tough materials, and a scientifically tapered basket permits full, heaped loads.

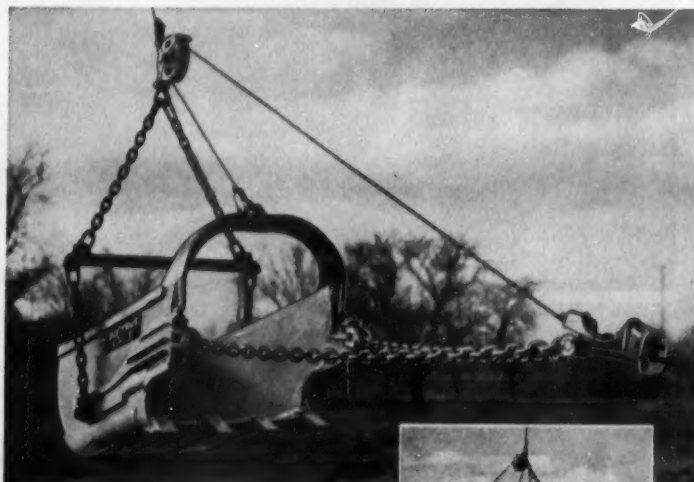
Less Bobbing, Spillage—Proper design incorporates correct flaring and balance of the bucket for clean carrying.

Fast Dumping—Smooth interior design and high arch permits quick, clean dumps.

Exclusive BECOLOY—A new special alloy developed by Bucyrus-Erie combines great strength with light weight, adds wearing ability and impact resistance.

New Bucyrus-Erie dragline buckets are available in three types: light, medium and heavy duty—solid or perforated. Your Bucyrus-Erie distributor has the experience to help select the right size and type for your operations. See him soon.

21R56



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GULF PRODUCTS *and* FINE SERVICE

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Relocating 4.676 miles of Route 5, a 4-lane expressway, from Clinton to T. B., Maryland. Contractor J. O. & C. M. Stuart, Inc., of Washington, D. C., have been using Gulf products for more than 20 years.

On this expressway relocation project, contractor J. O. and C. M. Stuart, Inc., use nothing but Gulf products.

The Stuarts have been Gulf customers since 1935 . . . because they know they can always depend on Gulf for quality products, helpful petroleum engineering counsel and prompt delivery. They use Gulf Dieselect Fuel and Gulf Super Duty Motor Oil for their diesels . . . Gulfpride Oil for their trucks . . . Gulflex A, the multi-purpose grease, for all automotive equipment . . . and tough Gulf Lubcote to protect open gears and wire rope on the job.

1400 Gulf warehouses are at your service, too. Why not find out exactly how they can serve you? Send the coupon now for your copy of the new booklet "Gulf and Your Business."



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Without any obligation on my part, send me a copy of the new booklet "Gulf and Your Business."

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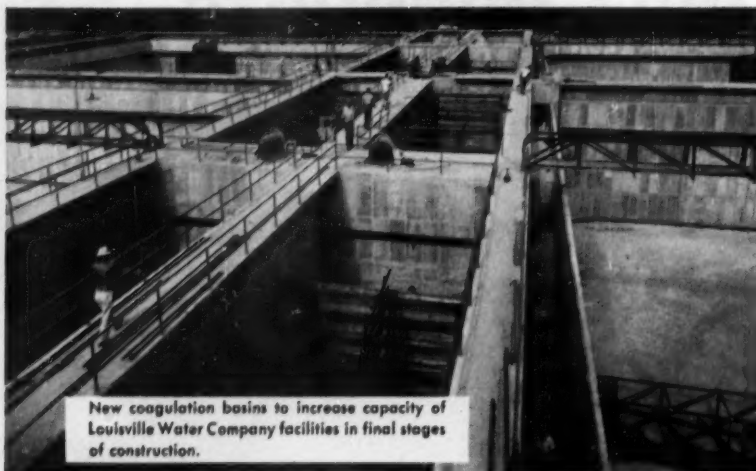
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THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

How Pre-Fab Forms Saved Time, Material On Water Plant Job



New coagulation basins to increase capacity of Louisville Water Company facilities in final stages of construction.

Contractor Forms 200,000 sq. ft. contact area with 14,000 sq. ft. of panels

Forming a 350' square water basin with exterior and interior walls 31' high presents no problem to the experienced contractor. But, when the job must be done in minimum time at lowest possible cost to meet tough pouring and finishing specifications, careful planning and operation are required.

When the Henry G. Bickel Company and the Charles A. Connel Company were awarded the contract for the massive Louisville Water Company coagulation basins at Louisville, Kentucky, they selected the Uni-Form Panel System to form the 200,000 sq. ft. of contact area the job required.

Forming started fast, because the Uni-Form Panel System is ready to use when it reaches the job. Valuable time, labor and material savings were made because Uni-Form Panels require minimum alignment and bracing on 1 side only. The Uni-Forms were assembled and locked into a tight, rigid form with Uni-Form Ties supplied in exact lengths to provide automatically accurate thickness of both battered and straight walls.

One side of the form was erected, permitting easy, unhampered placement of reinforcing. Since specifications

did not permit the use of chutes or tremies, pouring pockets were provided as the forms were closed to maintain positive control of concrete placement.

Fast erection and stripping features of the Uni-Form System enabled the contractor to form the entire 200,000 sq. ft. of contact area with only 14,000 sq. ft. of Uni-Form Panels. Panels were used an average of 14 times without the necessity of maintenance or repair.

The simplicity of the Uni-Form Panel System, together with the services provided by Universal Form Clamp Co., insured fast job progress and satisfactory completion under the capable supervision of Harry Hunter, Supt.

Uni-Form Panels are versatile, high speed forming tools. They're used by the country's most successful contractors to form every conceivable type of construction. They are rented or sold. Universal Distributors and Branches are located from coast to coast. Write for Uni-Form Catalog and complete details on Uni-Forming—the modern way to form concrete.

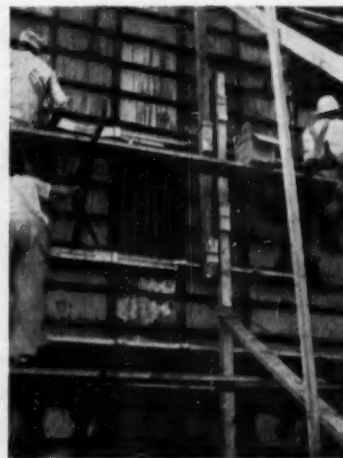
UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue • Chicago 51, Ill.



Section of exterior battered wall 31' high, showing Uni-Forming nearly complete. Uni-Form Scaffold Brackets replaced costly conventional scaffolding systems.



View of one of four clarifiers showing smooth-surfaced, clean walls which required no further finishing.



Pouring pockets permitted specified control of concrete placement.



A PCA "Engine-Take-Off" mixer truck—one of 42 1H PC-402-L Trucks with T. L. Smith Integral Mixers and Fuller 5-C-650 Transmissions.

FULLER *Transmissions* *all the way for*



"We've learned from experience that Fuller Transmissions are by far the most dependable we've ever used," says R. O. Lippi, Manager of San Francisco's Pacific Coast Aggregates, Inc. That's why PCA always specifies Fuller Transmissions on its new mobile equipment.

PCA, one of the largest and most successful aggregates producers in the country, operates 13 producing and 18 batching plants in Northern Cali-

fornia; is a wholesale distributor of building materials.

Fuller 5-C-650 Transmissions are used in PCA's entire fleet of 42 new International "E.T.O." trucks . . . the unique and highly practical "Engine Take-Off" mixer trucks that eliminate the mixer engine and make it possible to carry 6½ cu. yd. payloads within California state weight laws.

Its fleet of 16 diesel powered Wooldridge Terra Cobra wagons, used in the harvesting operation to produce rock, sand and gravel, is equipped with 200 hp HBIS Cummins engines and Fuller 4-speed 4-A-112

heavy-duty transmissions.

In addition, the entire PCA fleet of 200 trucks is equipped throughout with dependable Fuller heavy-duty transmissions.

On job after job, where loads are the biggest and the going is the toughest, you'll find Fuller Transmissions putting horsepower to work efficiently. Next time you order heavy-duty construction equipment, specify Fuller Transmissions.

From over 110 models available for rubber-tired equipment, you will find a Fuller Transmission designed to do *your* job.

One of PCA's fleet of Wooldridge Terra Cobra wagons equipped with Fuller 4-speed 4-A-112 Transmissions.



FULLER MANUFACTURING COMPANY
Transmission Division, Kalamazoo, Michigan

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KOEHRING WORK CAPACITY *in action . . .*



Lightning struck twice, setting fire to two storage piles of resin-rich pinewood at this Southern powder plant. For 48 hours it raged out of control. Fire-fighting equipment wet paths as two Koehring 605 cranes moved in with orange-peel buckets—widened fire-breaks, salvaged wood.



Meet the new 405 — In eastern Canada, a city street gets its face "lifted" with a 1-yard, 405 hoe. It's a new size, recently added to the Koehring heavy-duty line — digs 43 inches wide over side-cutters, 22½ feet below grade. Check into its other work capacities at bottom of page.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES	
		<small>(Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)</small>	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-foot radius
205 ON RUBBER	½-Yd.	30,000 lbs. 13,700 lbs.	at 12-foot radius at 20-foot radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-foot radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-foot radius at 30-foot radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-foot radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-foot radius
1205 CRAWLER	3-Yd.	190,000 lbs.	at 13-foot radius

Want more information? Call Koehring distributor today.



10 years on the rock pile — Feeding rock to crusher at a Mid-West quarry, veteran ¾-yard Koehring shovel helps produce 1,000 to 1,500 tons of crushed rock per day. Shovel has been in use for over 10 years. In all this time, owner reports that his repair costs have been practically nil.

REER



EXCAVATORS

CRANES

• DUMPTERS

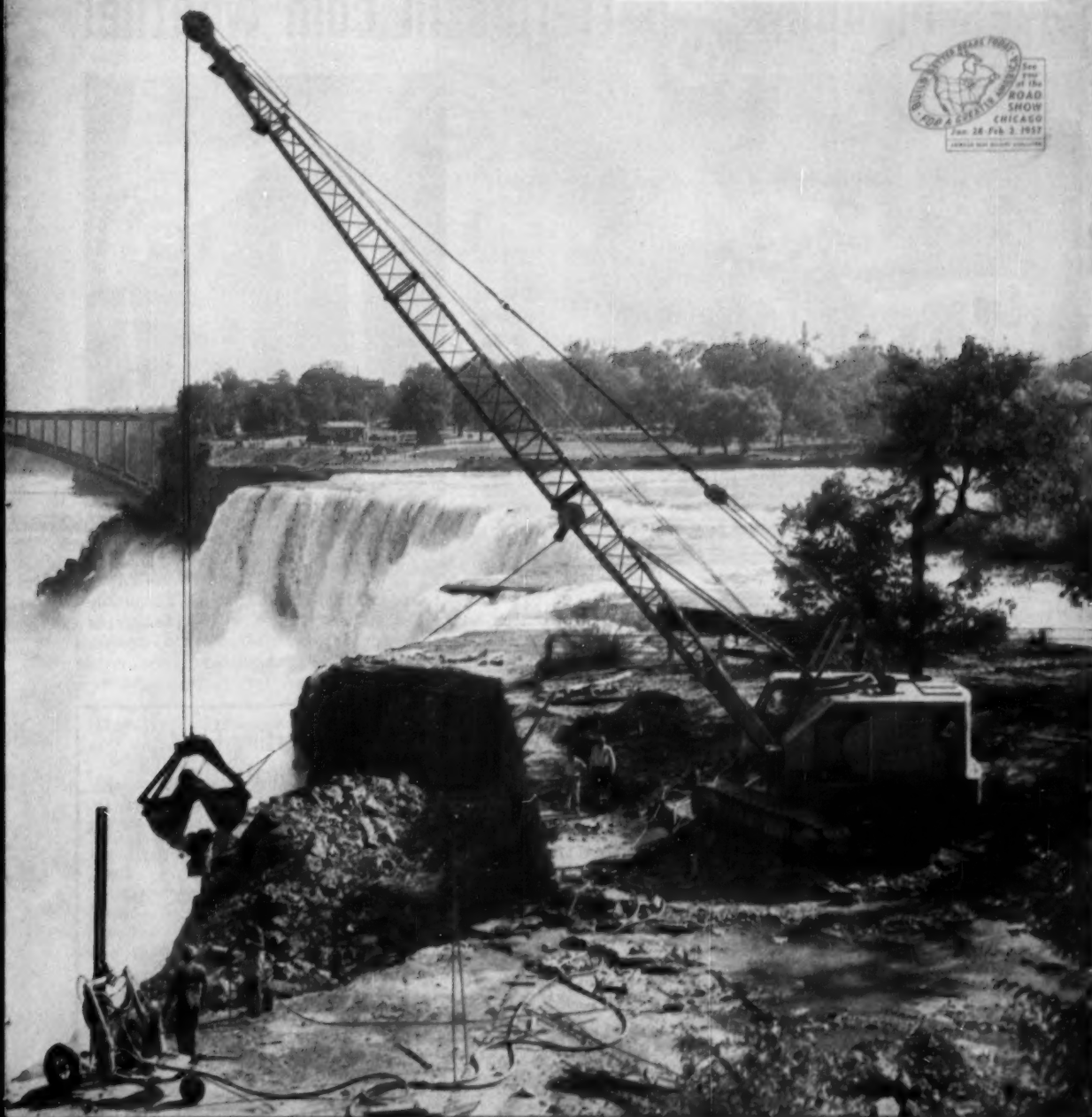
• PAVERS

• FINISHERS

• CONSTRUCTION MIXERS

• MUD-JACKS

185,000-ton rock slide — Extensive rock surgery will help curb further stream erosion at Niagara Falls. Work was made necessary when a weakened section of rock broke away from Lookout Point, at eastern end of the American Falls. Here, a Koehring 605 clamshell crane clears away debris and blasted rock.



KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON
PARSONS • Kwik-Mix

The Engineer's Report

CASE HISTORY

Chevron Starting Fluid
PRODUCT

Larry Hendricks Construction Co.,
FIRM *Mt. Vernon, Wash.*

Special fluid starts shovel in seconds saves manpower, batteries in cold weather



PIPE LINES, ROAD CONSTRUCTION and general contracting jobs keep this $\frac{1}{2}$ yd. Bucyrus-Erie shovel working hard the year 'round. The Larry Hendricks Construction Co. uses 7-cc. gelatin capsules of Chevron Starting Fluid to get the rig's GM-371 powerplant into action fast in cold weather. Owner Hendricks says, "This shovel makes money only when it's working. I can't afford to waste man-hours or wear down batteries getting it started. With Chevron Starting Fluid one man puts it on the job in a few seconds, even in coldest weather. We like the capsules, too. They deliver a safe, controlled charge. Too much fluid makes an engine race, and that ruins bearings

quick." Capsules are discharged through manual applicator installed in cab of excavator. (See arrow, right.) Chevron Starting Fluid atomizes at temperatures as low as -65°F . Fires under pressure or weakest engine spark.

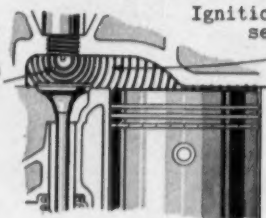
FREE FOLDERS tell more about the Chevron Starting Fluid and Chevron Pressure Primer System. Write or ask for them. **FOR MORE INFORMATION** about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies listed below.



TRADEMARK "CHEVRON" AND DESIGN REG. U. S. PAT. OFF.

Why Chevron Starting Fluid starts engines instantly

Highly volatile:
7 times
more than
gasoline



Ignition temperature
several hundred
degrees lower
than diesel
fuel

Contains wear-reducing lubricants

Additives inhibit ice formation

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributors

Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc.: Hatten Machinery Co., Seattle, has been named exclusive western Washington distributor for Wooldridge scrapers. Other Hatten lines include Blaw-Knox, Cleveland, F. D. Cummen & Son, Browning, GMC, Roebling, and International-Harvester.

Manitowoc Engineering Corp.: State Machinery & Supply Co., West Columbia, S.C., will cover South Carolina for Manitowoc's entire line of shovels, cranes, and draglines. W. A. Kinard, president of State Machinery, heads a staff of six sales-engineers.

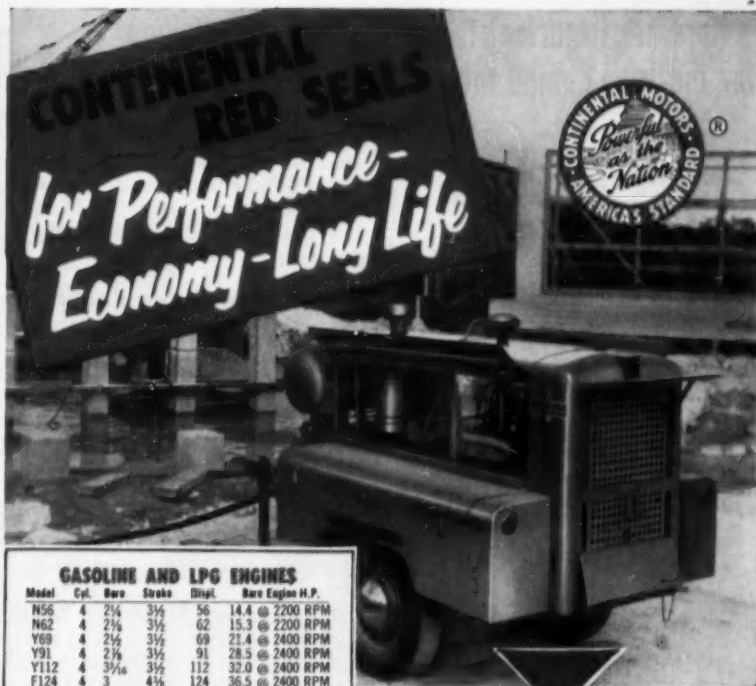
Universal Builders Supply Co.: The Dravo-Doyle Co., Pittsburgh, Pa., is appointed a distributor for Span-all, the new horizontal shoring supplied by Universal.

Clark Equipment Co.: Priester Machinery Co., Inc., Memphis, Tenn., is appointed to sell and service Michigan tractor-shovels and excavator cranes in parts of Tennessee, Mississippi and Arkansas.

Cleveland Trencher Co.: Marks Tractor & Equipment Co., Cleveland, O., is named a distributor of Cleveland trenchers and backfillers in northern Ohio. Their personnel have been trained at the Cleveland Trencher Co. factory.

Bucyrus-Erie Co.: Giles & Ransome, Inc., of Philadelphia, Pa., now offers sales and parts service on Bucyrus-Erie excavators and cranes in eastern Pennsylvania, southern New Jersey, and the entire state of Delaware. The distributor has been handling construction equipment in the Delaware Valley area for the past 40 yr.

Huber-Warco Co.: W. W. Williams Co. now handles the entire line of Huber-Warco road machinery in



INGERSOLL-RAND

GYRO-FLO 105 COMPRESSOR
POWERED BY CONTINENTAL RED SEAL,
SUPPLYING AIR FOR PAVING BREAKER
CUTTING OFF CONCRETE PILING

Year after year, ever since 1902, Continental engines have been proving their dependability in a steadily-lengthening list of special-purpose machines. Today, no matter what the exact requirement of the job, there's a Red Seal model—gasoline, Diesel, or LPG—engineered and built to meet it down to the last detail—a model with the proper performance characteristics, profile, shape and weight. In the industrial line there are models at closely-spaced levels—from 14 to 240 horsepower. You find Red Seals in many types of construction and industrial equipment, in farm machines of all descriptions, and in transportation, speeding the job and proving their inbuilt qualities of performance, economy and long life.

**SERVICE AND GENUINE RED SEAL PARTS
SOLD EVERYWHERE**

Continental Motors Corporation

MUSKEGON • MICHIGAN

8 EAST 45TH ST., NEW YORK 17, NEW YORK • 2017 S. SANTA FE AVE., LOS ANGELES 20, CALIF.
6120 CEDAR SPRINGS ROAD, DALLAS 5 TEXAS • 1232 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

GASOLINE AND LPG ENGINES

Model	Cyl.	Bore	Stroke	Displ.	Rated Engine H.P.
N55	4	2 1/4	3 1/2	56	14.4 @ 2200 RPM
N62	4	2 1/2	3 1/2	62	15.3 @ 2200 RPM
Y69	4	2 1/2	3 1/2	69	21.4 @ 2400 RPM
Y91	4	2 1/2	3 1/2	91	28.5 @ 2400 RPM
Y112	4	3 1/2	3 1/2	112	32.0 @ 2400 RPM
F124	4	3	4 1/2	124	36.5 @ 2400 RPM
F140	4	3 1/2	4 1/2	140	42.0 @ 2400 RPM
F162	4	3 1/2	4 1/2	162	49.0 @ 2400 RPM
F186	6	3	4 1/2	186	60.5 @ 2400 RPM
F209	6	3 1/2	4 1/2	209	68.0 @ 2400 RPM
F226	6	3 1/2	4 1/2	226	73.0 @ 2400 RPM
F244	6	3 1/2	4 1/2	244	79.0 @ 2400 RPM
M271	6	3 1/2	4 1/2	271	86.2 @ 2400 RPM
M290	6	3 1/2	4 1/2	290	92.2 @ 2400 RPM
M330	6	4	4 1/2	330	104.4 @ 2400 RPM
M363	6	4	4 1/2	363	128.9 @ 2800 RPM
B371	6	4 1/2	4 1/2	371	110.0 @ 2400 RPM
B427	6	4 1/2	4 1/2	427	127.0 @ 2400 RPM
G134	4	3 1/2	4 1/2	134	34.2 @ 2000 RPM
G157	4	3 1/2	4 1/2	157	40.0 @ 2000 RPM
E201	4	3 1/2	4 1/2	201	65.4 @ 2400 RPM
H227	4	3 1/2	5 1/2	227	54.0 @ 1800 RPM
H243	4	3 1/2	5 1/2	243	57.9 @ 1800 RPM
H260	4	3 1/2	5 1/2	260	62.0 @ 1800 RPM
H277	4	4	5 1/2	277	66.4 @ 1800 RPM
K363	6	4	4 1/2	363	123.0 @ 2400 RPM
J382	4	4 1/2	6	382	74.0 @ 1400 RPM
T371	6	4 1/2	4 1/2	371	119.0 @ 2400 RPM
T427	6	4 1/2	4 1/2	427	140.0 @ 2400 RPM
U501	6	4 1/2	5 1/2	501	159.0 @ 2400 RPM
R513	6	4 1/2	5 1/2	513	164.3 @ 2400 RPM
R572	6	4 1/2	5 1/2	572	182.4 @ 2400 RPM
R602	6	4 1/2	5 1/2	602	191.7 @ 2400 RPM
V603	8	4 1/2	4 1/2	603	220.0 @ 2800 RPM
S749	6	5 1/2	5 1/2	749	217.0 @ 2200 RPM
S820	6	5 1/2	5 1/2	820	237.0 @ 2200 RPM

CUSHIONED POWER DIESEL ENGINES

Model	Cyl.	Bore	Stroke	Displ.	Rated Engine H.P.
ZD129	4	3 1/2	3 1/2	129	34.0 @ 2000 RPM
GD157	4	3 1/2	4 1/2	157	39.0 @ 2000 RPM
*ED201	4	3 1/2	4 1/2	201	45.8 @ 2000 RPM
HD243	4	3 1/2	5 1/2	243	55.0 @ 2000 RPM
*HD260	4	3 1/2	5 1/2	260	59.0 @ 2000 RPM
*HD277	4	4	5 1/2	277	63.2 @ 2200 RPM
*JD382	4	4 1/2	6	382	72.5 @ 1600 RPM
TD427	6	4 1/2	4 1/2	427	106.0 @ 2000 RPM
RD572	6	4 1/2	5 1/2	572	154.0 @ 2000 RPM
VD603	8	4 1/2	4 1/2	603	175.0 @ 2600 RPM
SD802	6	5 1/2	5 1/2	802	202.0 @ 1800 RPM

*Available for industrial applications only.



Here are important facts
for the "man behind the gun"



This White 18" Dumpy level has
... more of the
features you want,
yet costs you less!

Before you buy, compare this White Dumpy level with a similar model of any other recognized make. From every standpoint — design detail . . . quality construction . . . work-speeding, life-lengthening features and cost — you'll quickly see why a White's the best buy you can make. It will make your work faster, easier, more accurate. Check this comparison chart:

FEATURES	B. White No. 7080	Instrument	
		A	B
Magnifying power of telescope	35X	30X	27X
Distance away you can read 1/100 ft. graduation	1200 ft.	1050 ft.	900 ft.
Diameter of objective lens	1.81 in.	1.485 in.	1.69 in.
Field of view (in minutes of arc)	64'	52'	60'
Coated optics	YES	YES	YES
Covered leveling screws	YES	YES	YES
Can you easily replace worn leveling screws in the field?	YES	NO	YES
Sensitivity of level vial (in seconds of arc per 2mm of graduation)	20"	20"	25"
Price — complete with carrying case, tripod and accessories — F.O.B. factory	\$315.00*	higher	higher

For complete details on the 18-in. Dumpy level and other equally fine engineering instruments, see your David White dealer, or write direct to DAVID WHITE CO., 311 W. Court Street, Milwaukee 12, Wisconsin.



We offer complete, expert repair service on all makes, all types of instruments.

*Price subject to change without notice.

SALES AND SERVICE ... continued

the state of Ohio. Williams will sell and service Huber-Warco motor graders, tandem rollers, 3-wheel rollers, and maintainers. Williams operates a main office at Marion and has five branches throughout the state.

On the Sales Front

Thermoid Co.: Four new district managers have been appointed by the industrial rubber division. They are John W. Minnock, in charge of the Los Angeles, Cal., district; Oswald J. Sand, manager of the San Francisco, Cal., district; Roy L. Wanamaker, manager of the Denver-Salt Lake City district; and Jerry W. Hillebrand, manager of the St. Louis, Mo., area.

Allis-Chalmers Mfg. Co.: J. G. Baseheart is now engine sales manager and F. M. Borwell is assistant engine sales manager of the Buda div., tractor group, with headquarters at the home office in Milwaukee, Wis.

Caterpillar Tractor Co.: William E. McCoy has been appointed sales manager of Cat's western division with headquarters in San Francisco, Cal. He succeeds Bernard L. Hagglund who died May 12.

In the Main Office

Koehring Co.: The appointment of Irvin L. Gebbard as general manager of Koehring Co. of California was announced recently. He succeeds Harry R. Powers, who was named district representative for Koehring's northwest territory.

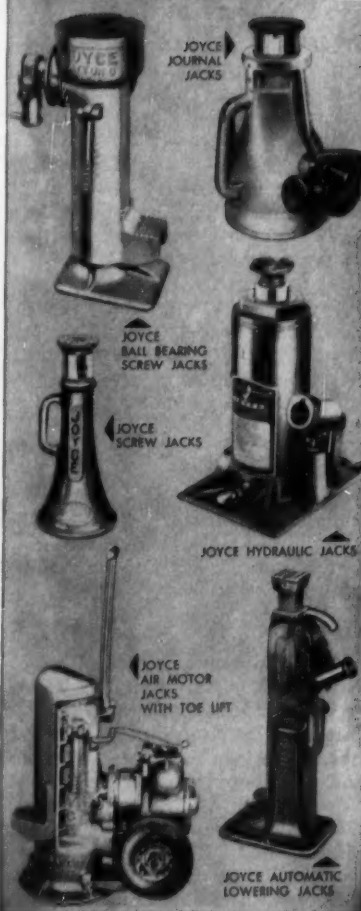
Pioneer Engineering Works, Inc.: A. J. Belanger has been elected vice president for sales of Pioneer, a subsidiary of Poor & Co., Chicago. Belanger joined Pioneer's engineering department in 1940, where his activities were devoted to the design and development of the company's continuous process bituminous plants. He was named sales manager in 1953.

Associations

Portland Cement Association: Dr. Fred D. Ordway, Jr., has been named director of the PCA Fellowship at the National Bureau of Standards, Washington, D. C. The fellowship operates as an integral part of the research department of the association. It employs a staff

JOYCE JACKS

*the complete line
for every need!*



Pick any lifting job . . . you'll find there's a Joyce Jack that will fill the bill! For Joyce builds a complete line of ratchet, screw, hydraulic, air operated jacks, trench braces and material lifting equipment . . . to meet every lifting application. And you can depend on Joyce Jacks too . . . for Joyce top-quality products have been the by-word for lifting equipment since 1873!

... write for complete
information today!

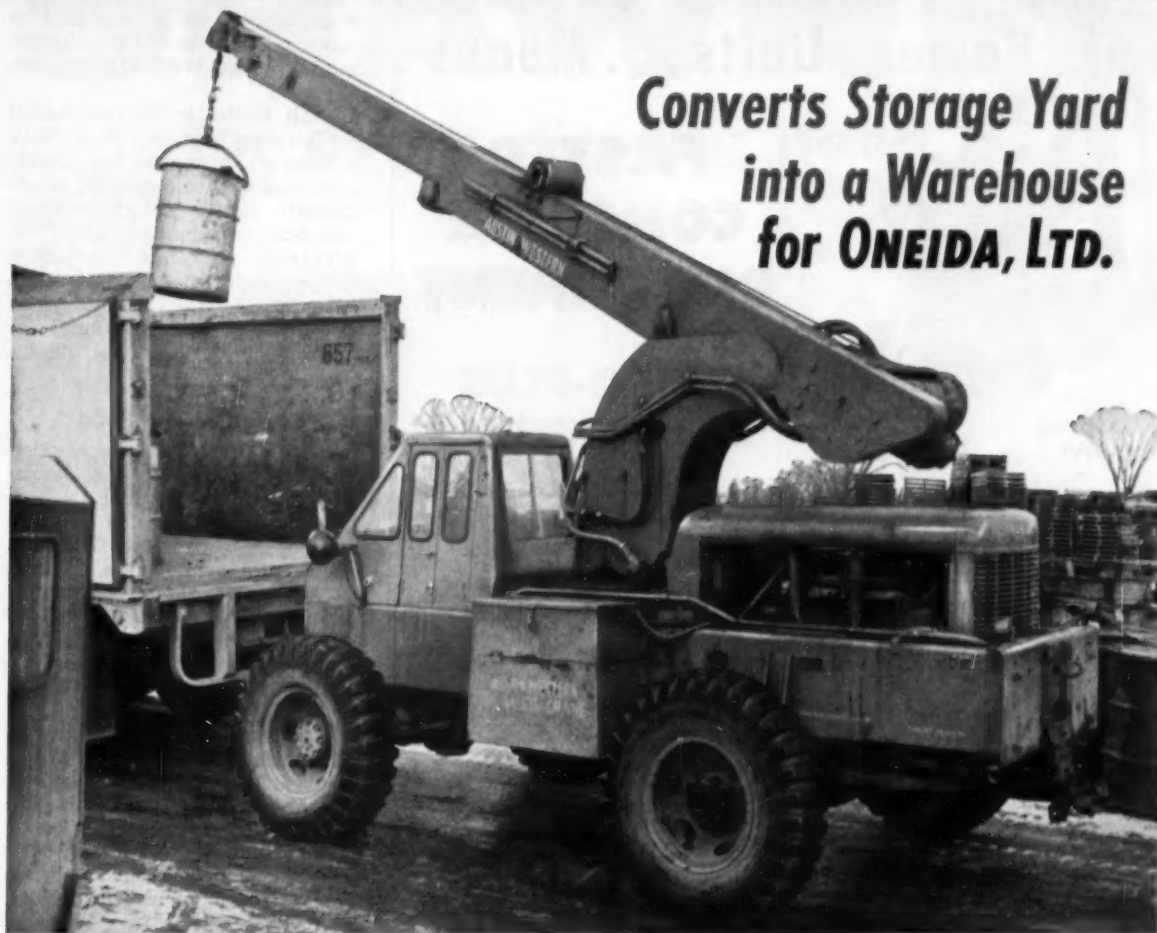


IN CANADA: Midland Foundry
& Machine Co., Ltd., Midland, Ontario

THE JOYCE-CRIDLAND CO.
DAYTON 3, OHIO

AUSTIN-WESTERN HYDRAULIC CRANE

**Converts Storage Yard
into a Warehouse
for ONEIDA, LTD.**



Versatile Crane Solves Storing—Warehousing—Handling Problems

Does Twice as Much Work with Less Effort

Here's what they say...

"Before we had our present complete unit, we used to skid heavy machinery half a mile down the road from the siding and into the plant where perhaps an overhead crane would place it. Now, the hydraulic boom of our Austin-Western crane handles any machine up to 5 tons in weight. It reaches in a freight car or skids a machine out onto the trailer and hauls it in short order into the plant aisle, very likely right to the point where it is to be set up, and lifts it into the place where it belongs."

"We have literally made a warehouse out of our storage yard with every location clearly marked and cases carefully piled in the places assigned to them."

"Hard to handle items, like telephone poles, are easy for our combination crane and trailer."

"Here in our main Plant a truckload of 12 drums, weighing from 1000 to 1800 pounds each, formerly caused heavy maintenance expense and downtime on our old truck and crane. Our Austin-Western equipment could handle twice this load with no trouble."

"The average for the last few months has shown more than 150 hours a month active service for our crane and trailer unit."

"A two-way radio in the crane cab and on each of our ten trucks enables the unit to save waste time, avoid doubling back and empty hauls."

For the complete Oneida Ltd. story, ask for Gould Certified Report No. 5511.



AUSTIN-WESTERN WORKS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division

OTHER DIVISIONS: Eddystone • Lima •
Electronics & Instrumentation • Hamilton •
Loewy-Hydropress • Standard Steel Works •
Madsen • Pelton

AUSTIN-WESTERN WORKS

607 Farnsworth Avenue, Aurora, Illinois

Please send complete Gould Certified Report No. 5511

Name _____

Title _____

Company _____

Street _____

City _____

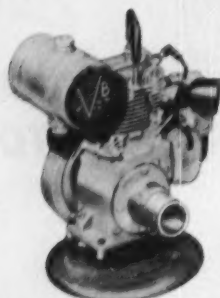
Zone _____

State _____

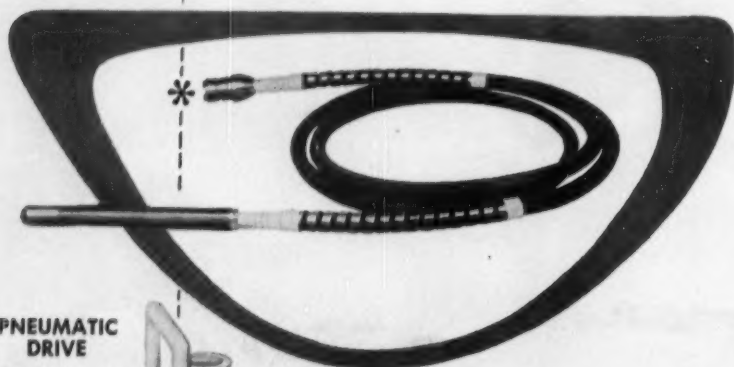
Complete Interchangeability of Power Units... Means

FASTER CONCRETE PLACEMENT

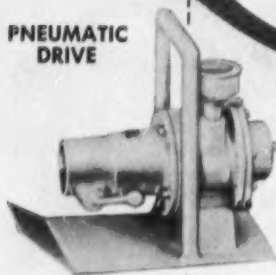
VIBRO-PLUS ROLLGEAR VIBRATORS



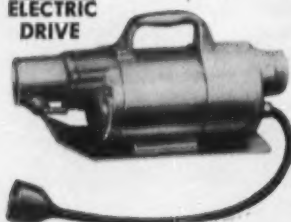
GASOLINE
DRIVE



PNEUMATIC
DRIVE



ELECTRIC
DRIVE



Most all Vibro-Plus power units — gas, electric or pneumatic — have the same convenient snap coupling between shaft and motor . . . Shaft and head can be connected or disconnected in a matter of seconds. This same snap coupling can also be adapted to most other makes of gas engines and some electric motors, enabling them to power the Rollgear shafts and heads . . . The shaft speeds of only 3600 RPM permit the patented Rollgear 'step-up' vibrator head to produce frequencies to 12,000 VPM.

Maintenance costs are held to a minimum with all Vibro-Plus equipment . . . Vibrator head runs dry — no lubrication needed.



VIBRO-PLUS PRODUCTS

INCORPORATED

STANHOPE • NEW JERSEY

SALES AND SERVICE... continued

of scientists who are engaged in basic research on the constitution and properties of portland cement.

Asphalt Institute: The retirement of Herbert Spencer, New York division engineer who was closely associated with the earliest developments in asphalt technology, has been announced by J. E. Buchanan, Institute president. Spencer, who has spent 50 yrs. in the industry, was the first president of the institute, and later became division engineer for the Atlantic-Gulf division.

Special Mention

Caterpillar Tractor Co.: Acquisition of Englehart Mfg. Co., Davenport, Iowa, by Caterpillar has been announced by president H. S. Eberhard. The Davenport Company, which has 175 employees, has been a major supplier of parts for Caterpillar for the past 13 years. Caterpillar issued 20,000 shares of its common stock for all the capital stock of Englehard.

Gar Wood Industries, Inc.: Reorganization of the construction machinery sales department has been announced. David J. Davis, formerly sales manager for tractor equipment sales, is the general sales manager of construction machinery. The appointment of Davis coincides with the transfer of all tractor equipment sales activities from Gar Wood's executive offices in Wayne, Mich., to Findlay, Ohio.

Euclid Div., GMC: The western regional office of Euclid is now located in the Latham Square Building, Oakland, Cal. M. H. Johnson, western regional manager and W. B. Dickerson, district representative, have their headquarters at the new location.

Detroit Diesel Div., GMC: Administrative sales and service facilities have been increased by establishing regional offices in six key cities throughout the country. Headquarters for regional areas have been opened within the last 90 days in New York, Atlanta, Detroit, Chicago, Dallas, and San Francisco. The following are in charge of these regional offices: R. W. Phillips, Atlanta; L. A. Steele, New York; J. C. Campbell, Detroit; D. & Schwendemann, Chicago; Eric Sutton, Dallas; and R. L. Burpee, San Francisco.

SHAWNEE

for every digging need



SHAWNEE "LOADMASTER"

A heavy-duty, industrial type loader which lifts 2 tons to 9 feet dumping height. Shawnee DL-102 kit enables use of loader's hydraulic system to operate any backhoe. Loader removes from tractor by 2 pins and 2 cap screws.

SHAWNEE "CHIEF"

Another Shawnee exclusive—PUSH-PULL POWER—on the new Shawnee Chief. The top cylinder pushes on the bucket boom and the bottom cylinder is synchronized to pull... provides more digging power.



SHAWNEE "SPECIAL"

Lifts 2000 pounds to 9 feet dumping height. Two-pin mounting enables removing or mounting on the tractor in 5 minutes. Bulldozer, street broom and many other versatile attachments available. Twin bucket cylinders. Welded box girder frame construction.

SHAWNEE "SCOUT"

Designed with hydraulic "feet" for quick leveling up to dig plumb holes, the D70HL Scout is ready for work seconds after the tractor stops rolling. Working on slopes or with one wheel on curbing makes no difference. Scout D70 available without hydraulic stabilizers.

Model D70 Scout has "A" frame base. Model D70HL with Hydraulic Feet as illustrated.



SHAWNEE MODEL 62

Lowest Priced Backhoe

A smaller version of the Scout designed for lighter digging needs, the Model 62 is exceptionally well built—smooth and fast in operation. Easily attached or removed in approximately 20 minutes.

THE COMPLETE SHAWNEE LINE:

CHIEF • SCOUT D70HL • SCOUT D70 • 62 BACKHOE • LOADMASTER • SPECIAL LOADER
STREET BROOM • HYDRO-CLAM • SCRAPER • BULLDOZER • ANGLE DOZER • REAR BLADES

Write for Additional Information

SHAWNEE manufacturing co., inc.
1947-SS N. TOPEKA AVENUE • TOPEKA, KANSAS

662-R

Cold facts about buying fuels, motor oils and greases

Why Standard Oil can serve

Got a construction job in the Midwest or Rocky Mountain states? Bidding on one? Already working a job? Then read how you can get better service and better fuels, lubricating oils and greases.

How you get service on the job.

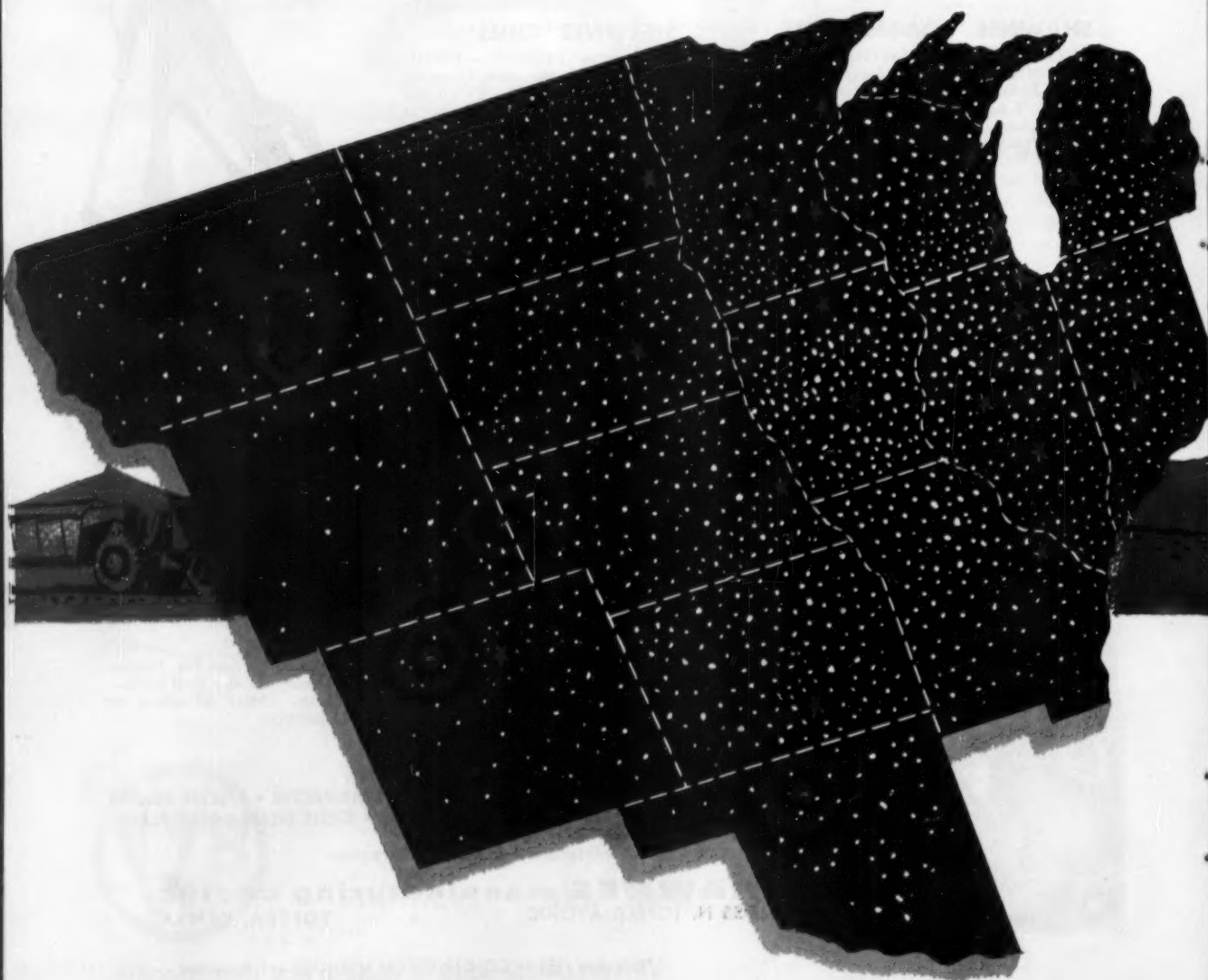
In the 15 Midwest and Rocky Mountain states there are more than 3,900 Standard Oil bulk plants. With this many plants, none can be more than a few miles from your job no matter where it is. Experienced men work out of these bulk plants to see that you get on-the-spot service. They see that you are supplied

day and night. If you work two shifts or even three, they may too.

In addition, there are 23 Standard Oil division offices in the 15 states. In each office there is a chief automotive engineer and a staff of automotive lubrication specialists. All of these men are qualified to give technical service. Most of the men have engineering degrees. They have received extensive training in Standard Oil's own Automotive Sales Engineering School. All of these men are Standard Oil employees.

The kind of service you get from STANDARD.

Automotive lubrication specialists from Standard division offices will survey your equipment and



you better

recommend the fuels, motor oils, greases to use. They will help you set up a preventive maintenance program and suggest lubrication schedules. They will back this up with service from the Standard Oil bulk station so that your equipment is *never* idle for lack of petroleum products. Through them you have a direct line to Standard Oil headquarters and laboratory for additional help.

Why STANDARD OIL products are tops for construction equipment.

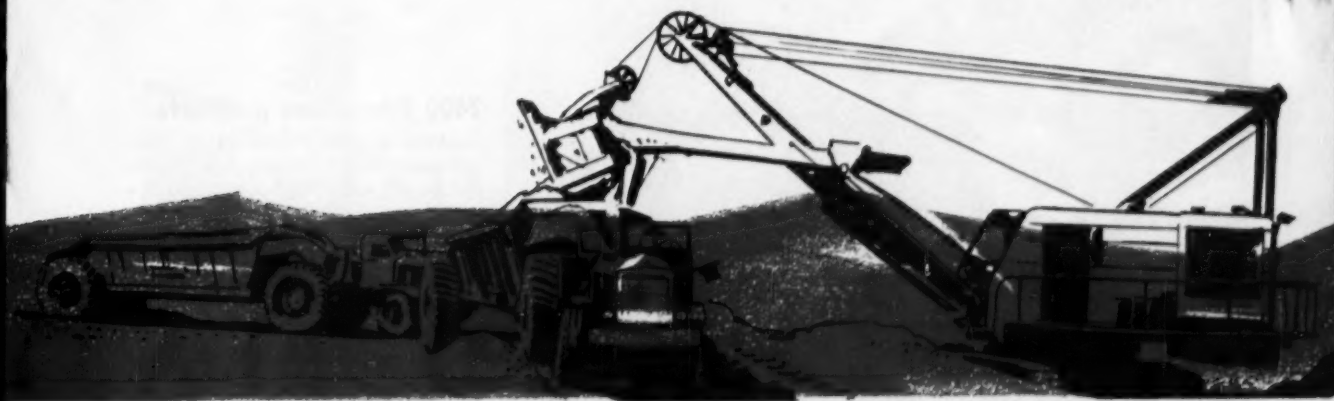
Standard Oil lubricants, fuels and greases are approved by equipment manufacturers. But there's more to it than just that. Most big equipment manufacturers' plants are right here in the Standard Oil territory. Standard works closely with these manufacturers, knows what's needed of the fuels, motor oils and greases used in construction equipment. Standard Oil fuels, lubricants and greases are used by many manufacturers in initial fills and lubrication. All products equal or exceed specifications of the manufacturer. They will stand up to any job you give them with plenty to spare.

Refinery to you, it's all STANDARD.

All Standard Oil fuels, lubricating oils and greases are made by Standard and delivered to you by Standard Oil employees with Standard's own distribution system. Everywhere you go in the Midwest and Rocky Mountain states there is a Standard Oil owned and operated bulk plant within a few miles. You deal with one company. Every Standard Oil supply point is equally and uniformly well run.

How to get in touch.

Because Standard Oil lubrication specialists so thoroughly cover their territory, you can depend upon meeting your man at any important contract letting—if you haven't already met him. If you miss him, look in the telephone directory of any town—no matter how small—nearest your job. You'll find the Standard Oil bulk plant listed under the Standard Oil name. If you still miss, sit tight, the Standard Oil man will be around to see you *before* you need him and he will be ready to serve you starting right then. If you would like more information right now, write or call Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Standard Oil serves these Midwest and Rocky Mountain states

Colorado
Illinois
Indiana
Iowa
Kansas

Michigan
Minnesota
Missouri
Montana
Nebraska

N. Dakota
Oklahoma
S. Dakota
Wisconsin
Wyoming



STANDARD OIL COMPANY (Indiana)

Construction Equipment News . . .

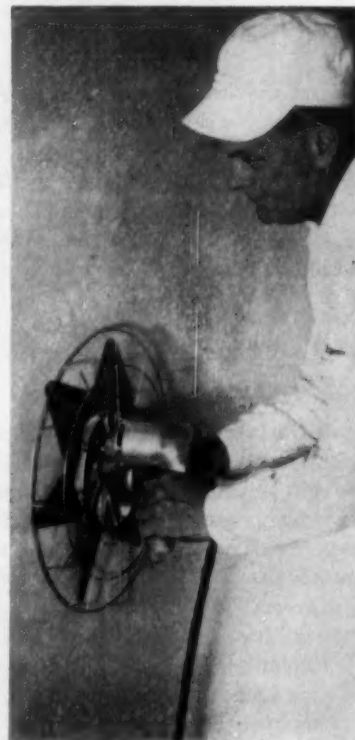


◀ Tows Its Air Supply

The G-800 Tracdrill, with two motors supplying independent power to each track, can tow its own compressor—thus keeping the air supply near the drill. A 365-cfm compressor will power the rig, which mounts a 4-in. drifter or a CP-556 Rotauger. A hydraulic U-arm supports the drill carriage. "Knee-action" tracks compensate for ground irregularities.—**Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N.Y.**

▶ Powered Finishing

The E-Z-Trowel, a power tool for plaster finishing, is said to increase a plasterer's production by 40%. The tool comes with a set of stiff blades for water troweling and flexible blades for drawing-up. It can operate to within 1/2 in. of wall angles, according to the manufacturer. It is powered by 110 v, ac or dc.—**E-Z-On Corp., 1725 W. Pershing Rd., Chicago, Ill.**

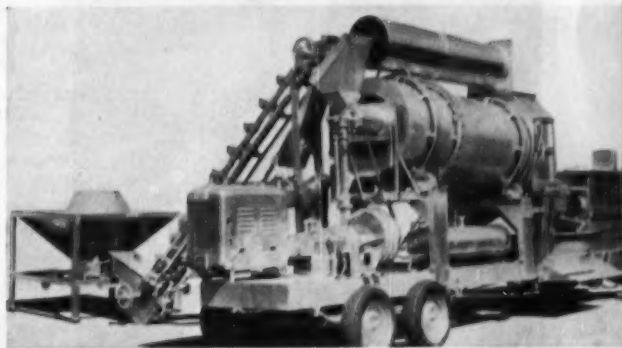
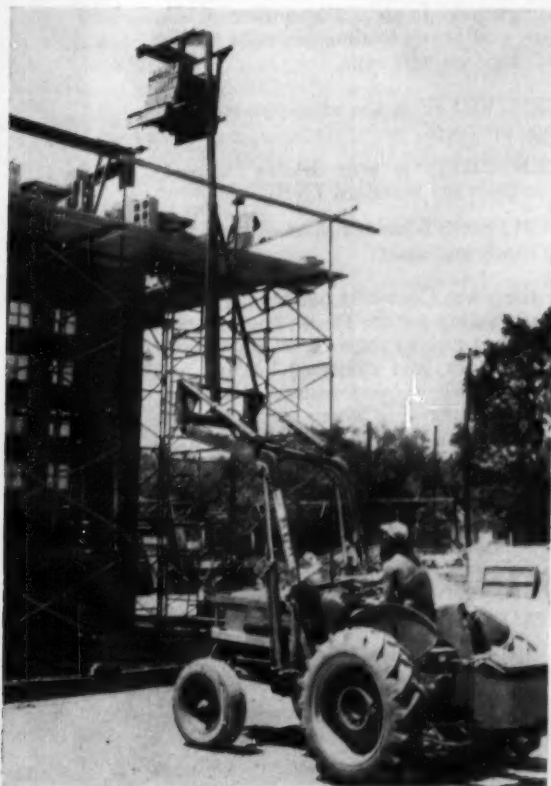
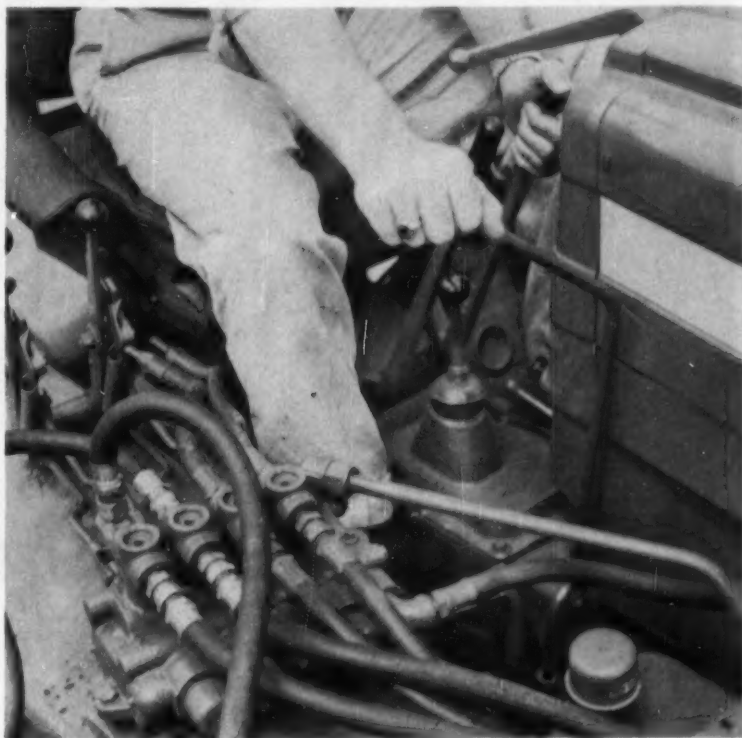


2400 Vibrations a Minute

Because it uses vibration as well as static weight, the 1 1/2-ton Vibrapac power roller will produce compaction densities that approach those created by deadweight rollers in the 8-10-ton class, according to the manufacturer. The vibrating mechanism consists of eccentrically weighted parallel shafts 36 in. long that are mounted on self-aligning bearings. They produce a dynamic vertical thrust of 2936 lb at the rate of 2400 times per min. Ground vibrations can be felt within a controlled variable radius of 24 ft. A series of rubber and spring mountings are said to eliminate 98% of vibration from the chassis. In tests, the roller produced densities of 105 on sand fills and 136.5 on high-type hot mix asphalt. This compares favorably with densities produced by 8-ton rollers. The Vibrapac sells for \$1495, fob Minneapolis.—**Rolcor Industries, Minneapolis 3, Minn.**

Attachments for the 420

A directional reverser attachment, right, is one of several optional features recently introduced for John Deere model 420 crawler and wheel tractors. The conveniently located reverser attachment permits forward and backward travel at the same speed without shifting gears, a useful feature when dozing or digging in close quarters. Other attachments available for the tractors include an easy-to-attach foot throttle that increases engine and travel speeds, a heavy-duty three point hitch, and a power take-off that permits continuous operation of attachments when the tractor is stopped. For increased versatility a five speed transmission is available as optional equipment. This gives the wheel tractor speeds of $1\frac{1}{2}$, $3\frac{1}{2}$, $4\frac{1}{4}$, $6\frac{1}{4}$, and 12 mph. Crawler tractor speeds with the new transmission are $\frac{7}{8}$, $2\frac{1}{4}$, 3, $3\frac{3}{8}$, and $5\frac{1}{4}$ mph.—John Deere Industrial Div., Moline, Ill.



See It at the Road Show

White's model L-10 asphalt plant—to be shown at the Road Show—has a 20-tph hot mix rating. Selling for \$13,500, the portable plant has a 1000-lb pug mixer and a 46-in. dia, 10-ft long dryer drum. An air compressor, 220-gal kettle, and a divided-compartment feeder are included. Power is supplied by 50-hp engine or 30-hp electric motor.—White Mfg. Co., Elkhart, Ind.

◀ Takes It Right to the Job

With the high lift utility boom, the tractor operator can hand materials or tools right up to second floor jobs. The boom can also be used for holding beams in place for bolting or welding, for assisting in setting up scaffolds, and many other similar lifting jobs. The

WE WANT YOUR TOUGH JOBS!

for J&L CenterFit Wire Rope

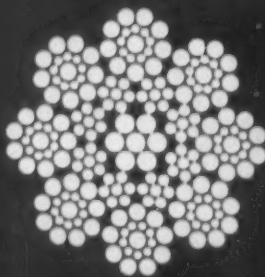
Three characteristics give J&L CenterFit Wire Rope the staying power to develop outstanding service in applications where shock, fatigue, and heavy loading limit the service life of standard wire rope.

1. CENTERFIT is the strongest standard rope produced.
2. CENTERFIT is more flexible in operation than any standard IWRC rope.
3. CENTERFIT has unsurpassed resistance to shock loading.

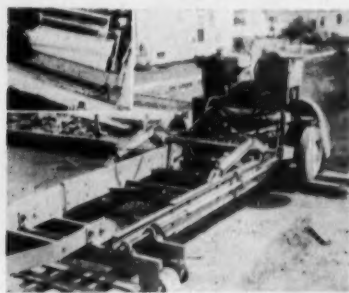
Over the years CenterFit has built a record for outstanding service life on the toughest applications such as shovel hoist ropes, back hoe pull ropes, and clamshell holding and closing lines where overloading is a factor.

If you're operating where loading, shock and fatigue are severe, chances are J&L CenterFit can help you cut your wire rope costs. Contact your nearest J&L Office or representative.

Jones & Laughlin
STEEL CORPORATION • PITTSBURGH



boom, which fits most Henry shovels, comes with a swivel hook and clevis. Attachments include a material fork and a concrete or mortar hopper of 1/3 yd capacity. The boom works from the tractor shovel controls. Adjustable in 1-ft steps from 11 to 16 ft, it telescopes into the main support frame, and can be locked in place with a pin. It will raise 170 bricks, 32 concrete blocks, or a loaded wheelbarrow to any height up to 20 ft, including the tractor shovel lift. It can be attached or removed easily from Henry shovels.—Henry Mfg. Co., 1700 N. Clay St., Topeka, Kan.



CURB BUILDER—General's new automatic curb and gutter builder is capable of forming monolithic or integral roll-type curbs at the same time and at the same rate as the main slab is poured. The new machine mechanizes curb and gutter forming, reduces manual labor costs, and eliminates separate construction of curbs. In operation, a hydraulically-driven curb forming roll, spinning at 300 rpm, profiles the gutter line and forms the curb as the machine travels along the forms behind the main paving equipment. Concrete for the curb is left along the side of the slab by an accessory offset screed attachment that fits the finisher operating ahead of the curb builder. Easily replaced contour cams provide for changes in curb and gutter profile. Machines are available with curb forming roll on one or both ends of the machine. Powered by a 12-hp air cooled engine, the curb builder is hydraulically driven. Travel speeds are infinitely variable from 0 to 40 fpm, both forward and reverse. A hydraulically operated, pneumatic-tired transportation rig affords easy portability. The units are available in widths of 10 to 15, 12 to 18½, 20 to 25, and 18 to 25 ft.—General Road Machines, Inc., Niles, Ohio.

Continued on page 200



Whether you have many employees . . .



or just a few . . .

Give them the protection of Hartford Group Insurance!

Once only "big" employers could have Group Insurance plans for their workers.

That time is past. Hartford now writes Group coverages for companies with as few as 10 employees (except in Florida, where the minimum is 15).

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- Poliomyelitis Expenses
- Major Medical Expenses (For groups of 25 or more)

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these worthwhile special advantages:

1. **Fast, expert claim service** through a nation-wide network of nearly 200 claim offices relieves you of practically all details and responsibility on claim matters. These facilities are particularly valuable to your branch offices and traveling employees.
2. **Streamlined premium payment procedures** and simplified policy forms reduce your work and lower your Group Insurance administration expense.
3. **Low cost** for you and your workers through efficient procedures and loss engineering activities that prevent abnormal loss experience.

You should certainly look into what Hartford has to offer. Both you and your employees stand to benefit! Call your Hartford Accident and Indemnity Company Agent or your insurance broker for details.



Year in and year out you'll do well with the

Hartford

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Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey . . . Hartford 15, Connecticut
New York Underwriters Insurance Company . . . New York 38, New York
Northwestern Fire & Marine Insurance Company
Twin City Fire Insurance Company . . . Minneapolis 2, Minnesota

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'TWINS'
will move the
CHEAPEST DIRT
on the big road
program ahead!



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- Contractors with "Twins" have a bidding advantage
- "Twins" can set new production records at lower cost on your jobs



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



TC-12**TWIN-CRAWLER TRACTOR****'EUC'****TWIN-POWER SCRAPER**

**To move dirt at the lowest cost
set your sights on Euclid "TWINS"**



Because it self-loads in any scraper material, the Twin-Power Scraper works independent of other equipment. It is revolutionizing road building methods on jobs where concentration of equipment in any single cut is not practical.



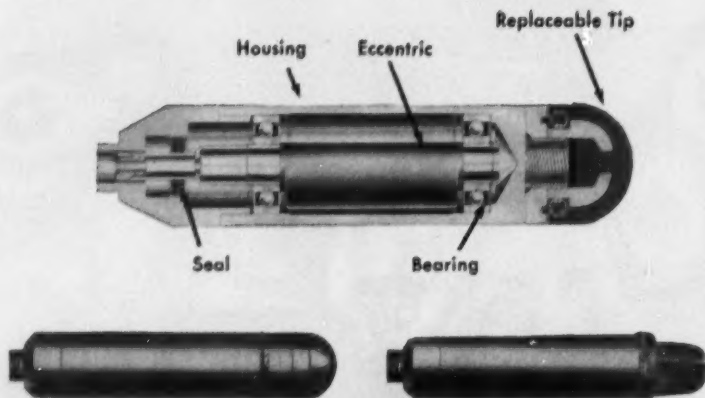
Unequalled power, speed and maneuverability make the TC-12 a top performer. It has all the features you've wanted in a big crawler.

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your best investment*

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- Check the list of owners who are using "Twins" to cut their earthmoving costs

*Get in touch with your
Euclid Dealer today!*

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



SIMPLE DESIGN—Short head Viber vibrators are simple in design and have few parts as indicated in cut-away picture above. Head assembly with replaceable rubber tip is shown at left. Assembly with 3-finned steel-cast tip at right.

Short Head Viber Vibrators Offer Major Advantages in Placement of Concrete

VIBER VIBRATOR heads are short, easy to manipulate—simple, easy to maintain. Simple construction of the Viber head makes a compact assembly which maneuvers easily around steel and into awkward, hard-to-reach places.

The Viber design utilizes a single eccentric weight in a heat-treated alloy steel housing. Other parts are one bearing at each end of the weight and a grease seal. Viber patented replaceable rubber tip is standard

equipment, with 3-finned steel cast tip optional.

Viber heads are light weight, ranging from 6 to 16 pounds . . . 11 to 12 inches in length and are available in four diameters—1¾ in., 2½ in., 2½ in. and 3 in.

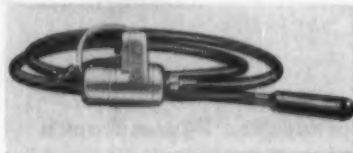
Flexible shaft driven, Viber vibrators are powered by electricity, gasoline or air . . . easily adapted to varying job conditions. They are high speed, operating at speeds between 8500 and 11,000 rpm.

Viber Replaceable Rubber Tips

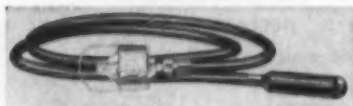
Viber rubber tips save contractors thousands of dollars yearly by preventing damage to forms of plywood and other expensive materials. In addition, since most wear on a vibrator occurs on the end of the housing, use of replaceable rubber tips greatly extends housing life.

Viber vibrators are effective. More work can be done in less time and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.

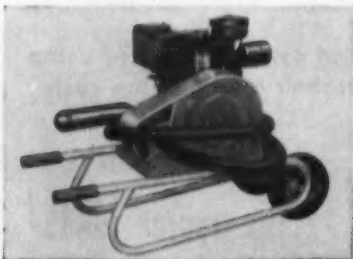
For complete information on Viber vibrators and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif. Dept. 8E11.



Model E Electric



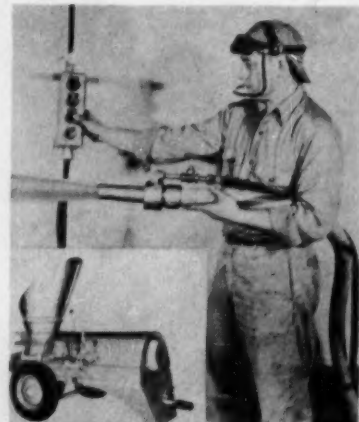
Model P Pneumatic



Model G Gasoline



VIBRATORS SINCE 1931

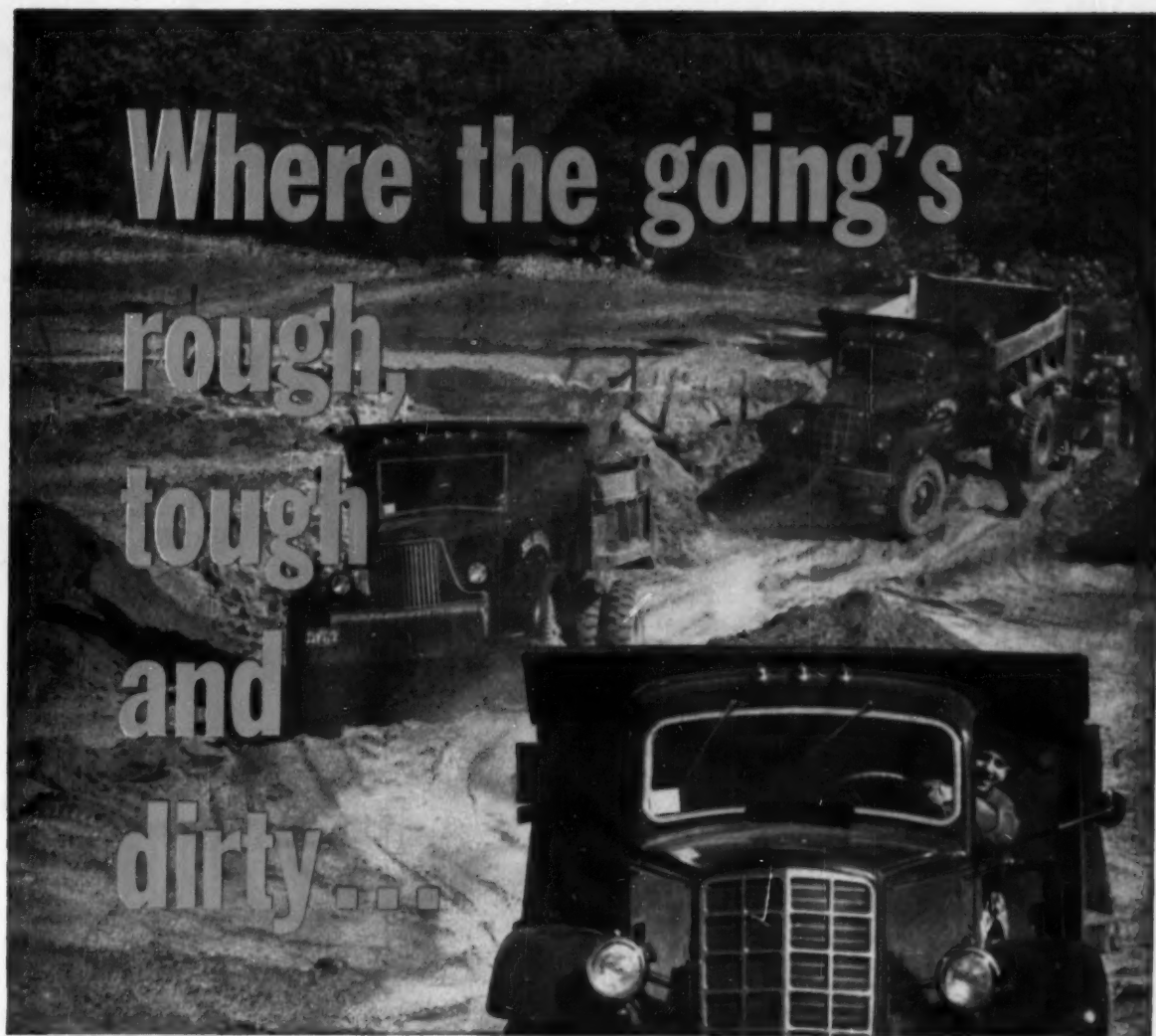


REMOTE CONTROL—A new control hook-up for the Jetcrete, Engineered Equipment's air-placed concrete machine, allows the nozzle man to operate the controls for stopping and starting the gun. This remote control set-up eliminates the need for a gun tender and considerably reduces the cost of operation. The unit is designed to be used with the motor powered Jetcrete models. It operates on 110 v.—Engineered Equipment, Inc., 1001 Linden Ave., Waterloo, Iowa.

BETTER TORQUE FLUID—A new torque converter fluid is said to cut down varnish deposits and to eliminate seal shrinkage and hardening. The fluid has been approved for Allison Torqmatic transmissions and retarders and is being field tested by other manufacturers. The fluid contains a new lubricating oil additive that is said to control seal swelling to within .2%. It also contains a high-temperature oxidation inhibitor that cuts down on sludge and varnish deposits on blades, pumps, valves and other moving parts of a converter. Pour point of the new fluid is minus 35 deg, thus assuring adequate lubrication during the coldest winter weather.—D-A Lubricant Co., Inc., 1331 W. 29th St., Indianapolis, Ind.

ENGINE - GENERATOR — The Witte model 100RDA engine-generator produces 12,000 watts continuously. The unit has a three-phase, 60-cycle generator directly connected to a 100.5-cu in., 18-hp, water-cooled diesel engine. The engine is designed with two horizontally opposed cylinders, a feature that is said to reduce the height of the unit, and to assure smooth op-

Where the going's
rough,
tough
and
dirty...



FRAM
is first!

HERE'S PROOF . . . In a recent survey among thousands of construction men—contractors, builders, engineers—respondents were asked to state what brands of equipment they preferred. The results of that survey, as far as oil filters go, are recorded in the chart below. It shows how FRAM is the overwhelming choice among the 3 leading filter brands. We think this speaks for itself!

FRAM
OIL • AIR • FUEL • WATER
FILTERS



BRAND	1ST CHOICE	MENTIONED
FRAM	36.4%	49.2%
"A"	18.9%	26.5%
"B"	12.1%	26.5%

FRAM CORPORATION, Providence 16, R.I. Fram Canada Ltd., Stratford, Ontario

COMMENT

from the
BUTLER ENGINEER

.... Of New Developments and Unsound "Bright" Ideas

We're getting tooled-up for handshaking purposes with all of you at the Road Show (Chgo) and the Concrete Masonry Show (St. Loee). And our exhibits will be more than something.

The emperor-sized Highway Program has to be met with equipment not even dreamed of five years ago. And it's going to be. You can be sure Butler Bin will be up there with startling new developments. Right now developments in the Butler 0-1-0 Automatic Road-builders Plant make it easy for one operator to dish it up for three dual drum pavers. And he can casually reach for a cigarette at any time.

We live in the Milwaukee Braves country. Does anyone want a flock of blue World Series tickets to paper a room?

When I was in engineering school I was taught

- (a) To analyze a given problem
- (b) To find out what others had previously done about it.

There are a few manufacturers in the materials handling field who have forgotten to take step (b). And they are such johnny-come-latelys that they are unaware that what seems like a bright idea was tried and found impractical by some of us old timers 25 years ago . . . They simply haven't the background to venture into sound, practical research on the really new and important developments. But they do make trouble for themselves and their trusting customers. Be sure you buy from an established, reliable manufacturer.

With great sincerity

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

EQUIPMENT NEWS . . . continued



eration. The engine-generator is only 30 in. high, 65 in. long, and 39 in. wide. It weighs 1700 lb. Features of the engine include wet-type replaceable cylinder liners, precision aluminum bearings, replaceable valve guides and inserts, dynamically balanced crankshaft, and full-pressure lubrication system. The generator has a direct-connected exciter, and it can be furnished with separate voltage regulation, radio - suppression equipment and other accessories.—**Witte Engine Works, United States Steel Corp., 1614 Oakland Ave., Kansas City, Mo.**



APPROVED TOOLS—International-Harvester has approved the Shawnee Loadmaster loader and the Chief backhoe for the I-H W-400 wheel tractor. The Loadmaster lifts 3500 lb to a 9 ft dumping height. It has double acting hydraulic cylinders and chrome-plated rods. It can be installed or removed on the W-400 tractor in 20 min. The Chief backhoe digs efficiently to 14 ft deep and has a horizontal reach of 20 ft. It operates in three 120-deg quadrants, which can be changed by the operator from his seat. Individually controlled hydraulic stabilizers enable plumb digging on slopes.—**Shawnee Mfg. Co., Inc., 1947 N. Topeka Ave., Topeka, Kan.**

CONCRETE BLADES—Four new concrete cutting diamond blades have been developed by Clipper—two for cutting old concrete and two for sawing green concrete. The saws for cutting old concrete, designated the CD-68-3 and the CD-78-3, are 1/4 in. thick and have a diamond depth of 3/16 in. The CD-68-3 is ideally suited for sawing

Gives a Man Giant Strength



CM PULLER

- **SMALL**
Lever is only 20 1/2" long.
- **POWERFUL**
83 lbs. on lever* produces 3,000 lbs. at hooks. *1 1/2 ton model.
- **VERSATILE**
"CM-Alloy" flexible welded chain. Lifts or pulls at any angle.
- **PORTABLE**
Made of aluminum alloy. 1/2 ton model weighs only 14 lbs. Capacities 1/2 to 6 tons.



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The "CM" Puller will do a "thousand-and-one" jobs for you. It will do them faster, safer and for easier. The "puller" is compact... stores conveniently in a tool box. Lifetime lubricated. Every contractor should have one.



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Loose, shifting sand licked with rubber-tired power

To relocate a Seaboard Air Line Railroad siding at Storey, Florida, Cone Bros. Contracting Company, Tampa, moved 160,000 yards of very loose, dry, shifting sand with one Tournatractor-and-scraper, 4 Super C Tournapulls, and 8 crawler-tractors. In the first 10 working days, the fleet moved 48,000 yards of the total amount of sand involved in the assignment.

On this new 5300' rail-bed which serves General Portland Cement Company, Cone Bros.' fast Tournatractor was the outstanding dirtmoving rig. It distinguished itself especially by its ability in sand operation.

Tournatractor . . . hard-working rig

Pusher-loaded by a crawler-tractor, the Tournatractor-scraper combination made fast work of loading sand out of the right-of-way . . . then traveled with a heaped load through loose, dry sand in the cut to a short exit-ramp. From the sandy cut, Tournatractor and scraper made a "U" turn onto haul road with very little tire penetration into the sand. Units then

spread on the waste dump. Since sand was not compacted, dump was loose and deep, but big rubber tires on Tournatractor provided good flotation.

Powerful Power Control Unit

Working with the scraper, Tournatractor proved a valuable pulling unit. A pair of powerful electric motors actuate Tournatractor's fast-acting, true-spooling rear power control unit. Safe, sure brakes on electric motors automatically stop unit the instant dashboard-switch is released. This power control unit works with any type of cable-control scraper which can be hitched to Tournatractor drawbar.

Combines speed and economy

Power from Tournatractor's big 208 hp diesel moves from transmission on high-speed, anti-friction bearings to drive wheels. With all-gear drive, you have no chain or tracks to stretch, snag, or wear. Maintenance is lower than that of crawlers, since 4 rubber-tired wheel units with anti-friction

bearings do the work of some 500 high friction track parts.

"Pleased with Tournatractors"

Vice President J. L. Cone, Jr., of Cone Bros. agrees with contractors all over the world who have found that Tournatractor's quick, on-the-job mobility . . . its fast push and pull ability . . . are valuable cost-saving advantages. He says, "Our Tournatractor is extremely versatile. Working with a scraper, its power means lower cost production. The root rake and the bulldozer mean higher profits for us, too. We are very pleased with the performance of our Tournatractor."

Investigate Tournatractor's profit advantages

Tournatractor's ability to move rapidly around a job under its own power is a big cost-cutting advantage. The handy machine quickly fills in on cleanup, dozing, towing, and pushing assignments . . . in addition to pulling duties like those described here. Tournatractor combines smooth, efficient, simple operation, and economy of maintenance, with fast 17 mph speeds that enable it to handle a wide variety of scattered assignments in a hurry. It cuts cost, makes profit for you!

Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. T-921-88-5.



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

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UNIT MODEL 510

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NOTHING BUT THE BEST! There's no substitute in the $\frac{3}{8}$ -yard excavator field for EXPERIENCE. UNIT has it! UNIT knows what you need in a $\frac{3}{8}$ -yard machine . . . knows how to engineer the power, over-all performance-superiority and economy of operation for the jobs you want to do profitably with a $\frac{3}{8}$ -yard dragline, clamshell, crane or trencher. The New UNIT CHALLENGER proves this with such features as: Self-aligning Hook Shoes . . . Force Feed Lubrication . . . Full Floating Trunnion-Mounted Tapered Drums . . . Torque Converter, etc.

See the many other new features illustrated and described in UNIT CHALLENGER Bulletin C-800. Write for your copy of this bulletin.



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Geared to boost your earnings!



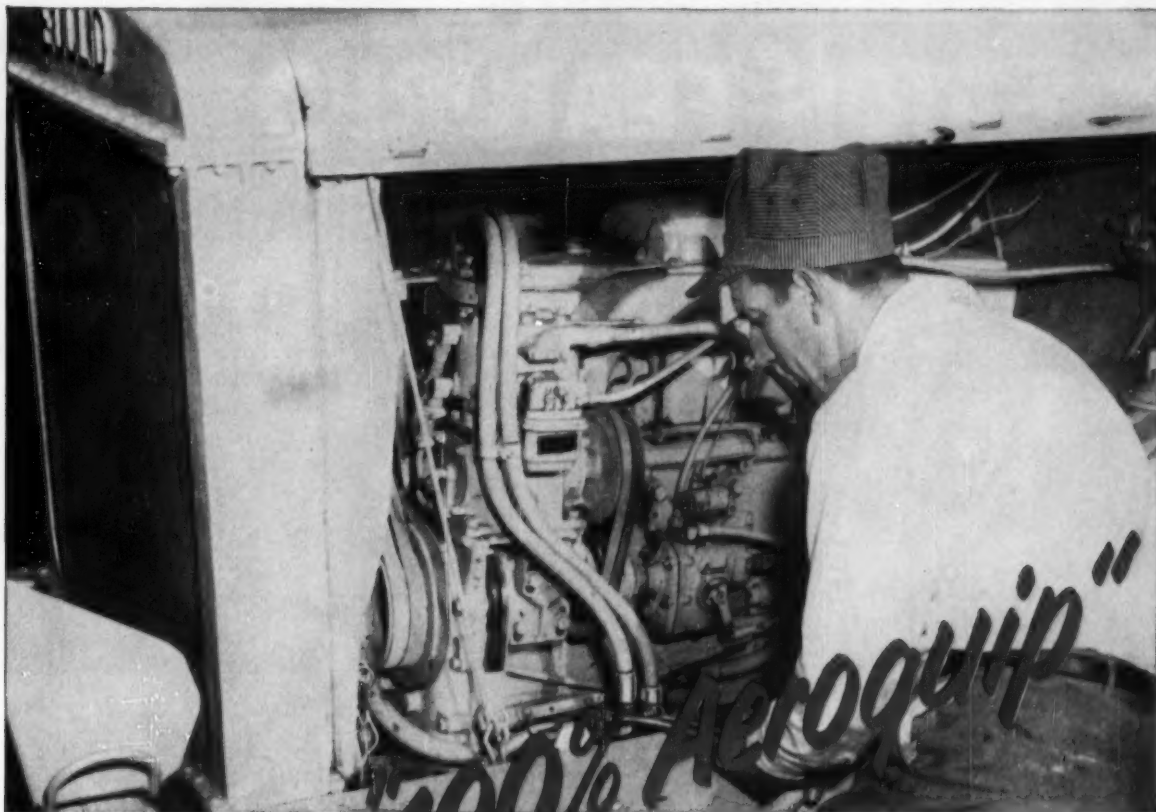
EQUIPMENT NEWS . . . continued

old concrete containing aggregates of medium hardness, while the other blade can be used for sawing concrete containing soft aggregates when used with a saw of 25 hp or more. This blade is also designed for cutting asphalt. The two blades for cutting green concrete are $\frac{9}{64}$ in. thick and have a diamond depth of $\frac{3}{16}$ in. The CD-69-3 will saw control joints in all types of aggregates but it is best suited for aggregates in the medium-to-hard groups, such as granite and river gravel. It has been used to cut joints as old as seven days with a 25 hp saw. The CD-79-3 is best suited for sawing green concrete with a medium type aggregate such as weathered granites, dolomitic limestone, and slabs containing limestone and river gravel.—Clipper Mfg. Co., Suite 631, 2800 Warwick, Kansas City, Mo.



JUNIOR MIXER—The Dandie Junior $\frac{3}{4}$ -S tilt-type mixer is a rugged but light-weight unit with frame, drum and yoke fabricated of welded box-section steel. It is powered by a 2.2-hp air-cooled gasoline engine with single V-belt power transmission. The mixer has four blades, a replaceable ring gear, and a hand-controlled tilting device that is slotted to hold the drum in any position. A steel axle and pneumatic tires that absorb travel shocks make the unit extremely portable. Another feature is the low 40-in. changing height and a 17-in. drum opening for fast and easy loading. —Kwik-Mix Co., Port Washington, Wis.

EMERGENCY LIGHT—With three 5000-candle power sealed beam lamps atop a powerful battery, the Sentry-Lite is designed to instantly provide a quantity of illumination over a large area. The total



Aeroquip Flexible Hose Lines are used for fuel and lube oil lines on this GMC truck engine.

"We Recommend These Hose Lines for All Heavy Equipment Operations"

says R. D. Pringle, Equipment Superintendent,
Vecellio and Grogan, Inc., Beckley, West Virginia

Equipment Superintendent R. D. Pringle has to keep more than 50 pieces of construction equipment in working order. He reports that when replacement hose lines are needed, for hydraulic, fuel, lube oil and air applications, he always uses Aeroquip.

"We use Aeroquip because the results are better," says Mr. Pringle. "And, because by using bulk hose and reusable fittings, we can make up any length hose line and run it anywhere desired."

You, too, can rely on Aeroquip Hose Lines for dependable performance and quick field replacement. For full information, call the Aeroquip Distributor listed in your Yellow Page Phone Book or write us.



Using bulk hose and reusable fittings, replacement lines can be made in minutes, when they are needed.



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reduce hauling costs, keep
trucks on the job



PLANETARY GEAR DESIGN —

distributes pressure and wear over four planetary gears, resulting in lower unit stress, reduced maintenance, longer axle life.

FORCED-FLOW LUBRICATING SYSTEM —

supplies positive lubrication to all moving axle parts, even at slowest vehicle speeds.

POSITIVE SHIFT CONTROL —

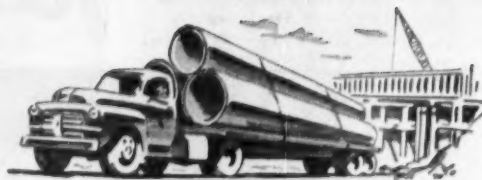
provides quick, easy shifts. Drivers use available gear ratios—the right ratio for road and load conditions.

SELF-CONTAINED AIR BRAKE —

provides for greater braking efficiency; quicker action, quicker release; quick, easy reline. Available on Eaton air brake models.

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eliminates the possibility of harmful distortion or misalignment under full load, holds maintenance to a minimum.



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weight of the unit is only 40 lb, including a battery that provides 6 hr of illumination. With the battery held in a compact, 18-gage steel casing, the over-all dimensions are 8x10x16 in. The test panel on the front of the case includes a momentary switch for testing the unit, an AC fuse, a toggle switch, and a pilot light that indicates the unit is in working order. Called the model J55, it also has an automatic recharger that operates off standard electrical power to keep the battery at peak capacity.—Sentry-Lite & Battery Div., Hobby & Brown Electronic Corp., 237 Sunrise Highway, Rockville Centre, N.Y.

RESISTS STICKING—When Powerfilm MRC is sprayed, brushed, or wiped on equipment or forms, it dries to a thin, waxy coat that is said to prevent concrete, clay, moist dirt, and other materials from sticking. It is effective on concrete forms, transit-mixer trucks, dump truck bodies, loader buckets, and other materials handling equipment. It may be applied to wet surfaces because it chemically displaces water. Although it contains a rust preventive additive, it leaves no oil stain on concrete, and will not attract dust or other foreign substances. It is removed easily with a petroleum solvent or cleaning naphtha. Five and 15-gal pails and 30 and 55-gal drums are available.—The Thomas Co., 1645 Hennepin Ave., Minneapolis 3, Minn.

POWER BUGGY—Cmetco's new power buggy can stop with a 1450-lb load on a 35% grade, latch-park, and then pick up the load and resume climbing. The buggy, which handles loads up to 2580-lb gross,

Yes, an OWEN BUCKET swung from any crane boom will always give you:

FASTER Penetrating ACTION
when handling aggregate and loose materials;

FASTER Digging ACTION
with variable, multiplied closing power for excavation;

FASTER Loading ACTION
by reason of correctly engineered bowl designs with balanced power on each jaw;

FASTER Discharge ACTION
The combination of adjustable reeving and weight concentration in area surrounding lower sheave block exerting a direct pull on the cable, results in quicker opening and faster dumping.

What is the life of an Asphalt pavement?



Milwaukee, Wisc. demonstrates an important advantage of Asphalt paving to public officials.

After it has given years of satisfactory service (27 years in the case of this Milwaukee street), an Asphalt pavement's life can be prolonged for many additional years speedily and economically.

Milwaukee added a new 3-inch Texaco Sheet Asphalt surface to its old Asphalt Street. The new and the old surfaces knit together in a perfect, lasting bond. As a result, for the moderate cost of the new Texaco surface, the city has a substantially stronger pavement than before, which will be serving traffic for years to come.



By laying a new Texaco Sheet Asphalt wearing surface on 27-year-old Asphalt pavement on West North Avenue, Milwaukee gets many additional years of service. Lower photo shows this important thoroughfare after it was resurfaced with Texaco.

CONTRACTOR . . Badger Construction Company, Milwaukee

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer public officials a wide choice of street and highway improvements, from heavy-duty plant-mixed asphalt paving down to inexpensive surface-treatments for light traffic. Helpful information concerning all of these types is supplied in two free booklets. You can secure copies without obligation from our nearest office.

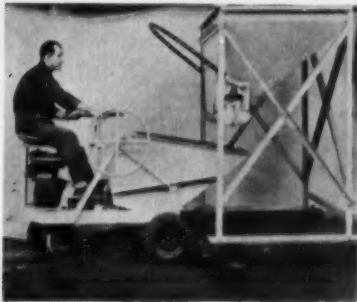


THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17

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TEXACO ASPHALT



can be operated immediately by anyone who can drive an automobile. The top speed is 17 mph when empty. Dual-drive wheels insure good traction on wet ground or steep ramps. The buggy is powered by a Kohler K-160 gasoline engine that weighs only 67 lbs, delivers 6.6 hp at 3600 rpm. It is a four-cycle, single-cylinder, air-cooled engine equipped with crankshaft magneto, oil bath fly-weight governor, oil bath air cleaner, and silencer-type muffler. —Creative Metals Corp., Emeryville, Calif.



TRUCK CRANE—Standard equipment on the upper works of Insley's new 12½-ton truck crane includes independent boom hoist, brake type cab lock, boom back-stop, and double hook rollers. Standard boom length is 30 ft. The new two-axle, 4x2 carrier is equipped with air brakes and hydraulic steering, and independent travel is available as an optional feature. The crane is 14 ft 7 in. long, 10 ft wide, and its turning radius is 24 ft. Tires are 10:00x20, 12 ply. —Insley Mfg. Corp., Indianapolis 6, Ind.

LPG SALAMANDER—The Hauck chamber salamander, which burns liquified petroleum or bottled gas, has a shell and hood of 16-gage steel on 10-gage channel legs. It is fired by either a low pressure or a high pressure internal jet gas burner that is easy on fuel consumption. Both burners are furnished



You'll find it so easy to wheel heavy loads in Sterling Barrows. Only a minimum of effort is required. Sterling's perfectly balanced construction permits 80% of the load to be carried on the wheel . . . only 20% by the operator. This increases efficiency . . . allows more loads to be hauled each day . . . reduces hauling costs.

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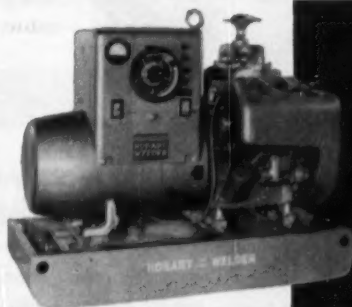
Sterling
WHEELBARROWS

Equipped with steel wheel or wheel with zero pressure or pneumatic tire.



Model C5W with Pneumatic Tired Wheel and Wood Frame.

Look for this Mark of STERLING Quality



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Welds anywhere—saves costly tear-downs and expensive parts

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furnishes 110 volt current for tools, lights, motors, etc.

Cut Costs
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There's a size and type to meet every welding requirement

Lightweight air cooled "Husky Boy" DC Welder



Use the coupon
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Here's a valuable 2 in 1 unit that's always ready on a moment's notice to go to work for you. Let's your own men do repair work quickly and easily without costly shut-downs. You can save hundreds of dollars by doing your own welding with a unit that also furnishes power for operating auxiliary equipment. You wouldn't be without this valuable combination unit once you've seen and tried it. No obligation—why not mail coupon today for complete information.

• To HOBART BROTHERS CO., Box 6116, Troy, O.
Without obligation, send complete information on the following:

☐ amp. capacity ☐ AC Welder-AC Power Combination ☐ Standard DC Engine Drive Welder ☐ "Husky Boy" air cooled DC Welder

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A Durable, Quick-Acting Coupling for Your Air and Pneumatic Hose



"DIX-LOCK" Quick-Acting HOSE COUPLING



A convenient coupling for all types of air and pneumatic hose lines. Light in weight, yet exceptionally strong and durable, with a quick-acting feature that makes it especially efficient and economical for use on pavement breaking, tamping, riveting and similar tools, and for many plant applications. To make a connection, just press two fittings together and give a quarter turn. To disconnect, pull back sleeve on male end and repeat the quarter turn.

The "Dix-Lock" is of modern, streamlined design, with smooth exterior approximating the outside diameter of the hose. Made in plated steel or brass, in all I.P.T. and hose end combinations, in sizes $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ ". Interchangeable with Bowes type couplings.

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Valve & Coupling Co.

GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA. BRANCHES—CHICAGO
BIRMINGHAM • LOS ANGELES • HOUSTON • DIXON VALVE & COUPLING CO., LTD. TORONTO
ASSOCIATE COMPANIES: SUEK IRON COMPANY, INC. QUARRYVILLE, PA. PRECISION DRAWN STEEL COMPANY, CAMDEN, N.J.

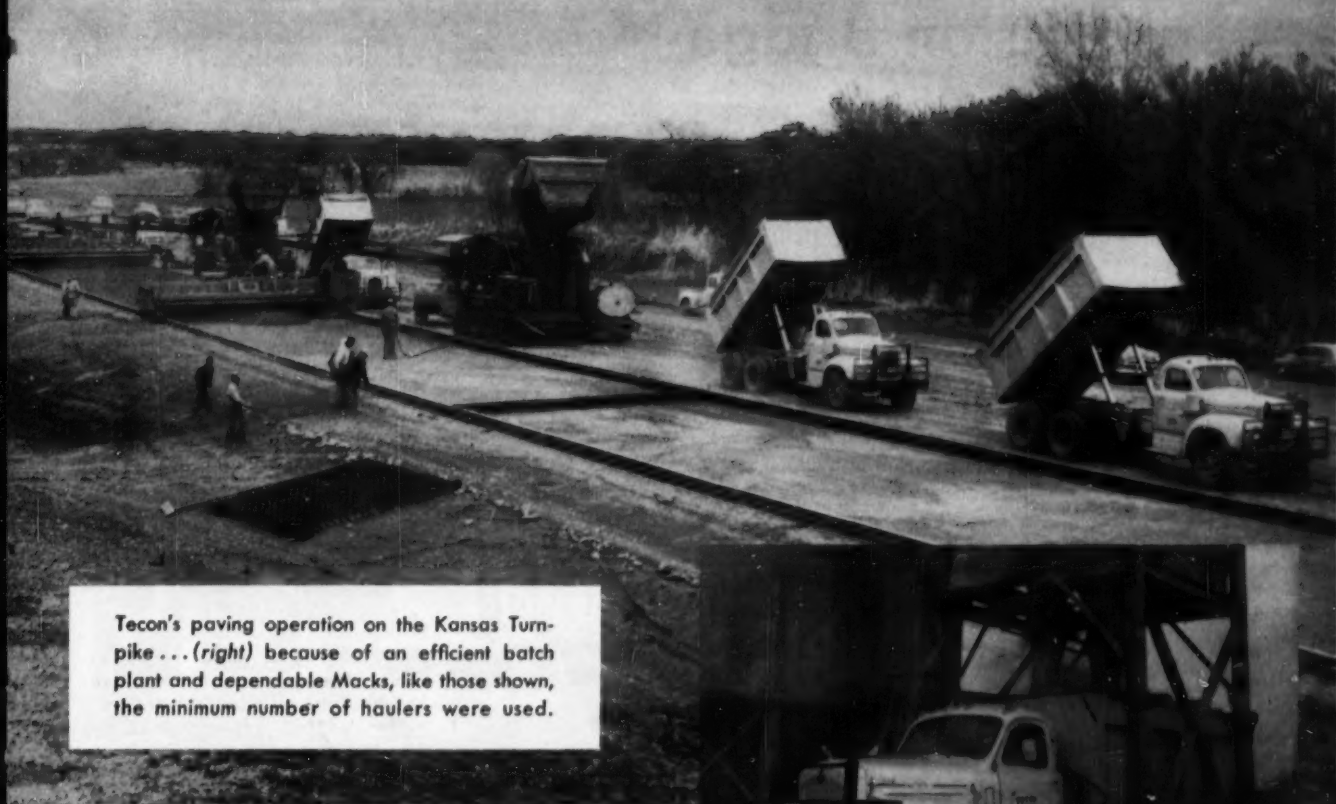
EQUIPMENT NEWS . . . continued



with control valves and an automatic safety shut-off is provided as standard equipment with the low pressure model and as optional equipment for the high pressure burner. The heating chamber radiates a large volume of heated air that is directed downward and outward by the conical cover. The salamander is made in two sizes: 150,000 btu and 225,000 btu per hr. —Hauck Mfg Co., Brooklyn 15, N.Y.



NEW CARRIER—A redesigned truck, incorporating the Clark power train, is featured in the Michigan Model T-20 excavator crane. The crane has a gvw rating of 42,300 lb with full crane equipment, and this can be reduced to 37,600 lb for highway travel by removing rear outriggers, crane boom, and counterweights. The power train consists of Clark's 5-



Tecon's paving operation on the Kansas Turnpike... (right) because of an efficient batch plant and dependable Macks, like those shown, the minimum number of haulers were used.

Batch trucks speed Kansas Turnpike paving

... as much as 3,000 linear feet of 10-inch, 24-foot pavement in a 10-hour day ... averaging 2,600 linear feet per day—that's quite a record for two twinbatch pavers working tandem with wire fabric laid on the 7-inch pour of the first paver. To a large extent this efficient paving was due to the trucks hauling the dry batches to the pavers—Mack trucks, each carrying four batches in their compartmented dump bodies.

Mr. S. N. Foster, project manager for The Tecon Paving Company of Dallas, Texas, is all for dependable Mack haulers—and for good reason! Tecon's 12 Mack B-42S dumpers can be depended upon for top performance 10 hours a day, week after week ... assuring an uninterrupted flow of dry mix to the pavers.

Why not discover for yourself, like Tecon, that when you use Macks, you can do more with fewer

trucks ... more efficiently ... and at less cost. Get the facts from your Mack Dealer or Representative. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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MACK
first name for
TRUCKS



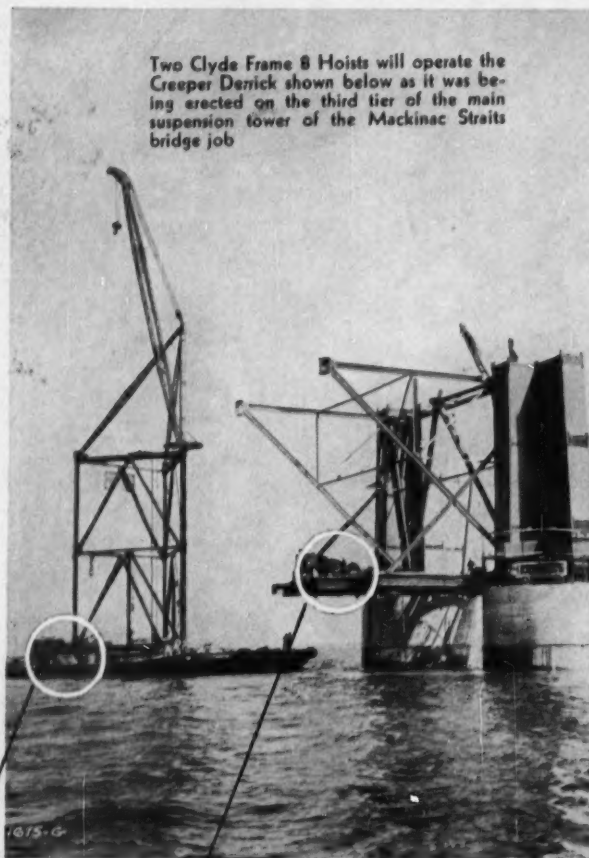
CLYDE "SAN FRANCISCO BAY BRIDGE" HOISTS TEAM
WITH NEW CLYDE STEEL ERECTORS' HOISTS

Spotting Steel on World's Largest Suspension Bridge

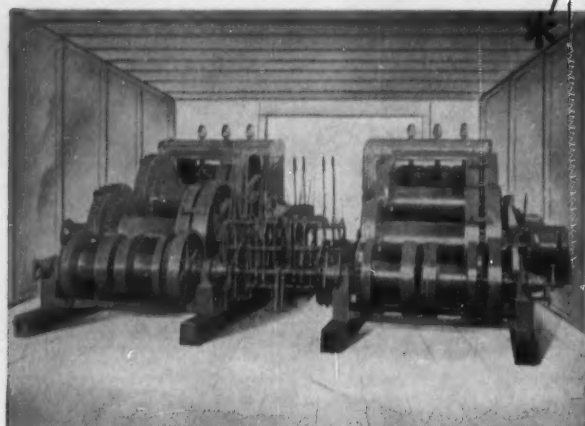
The twenty-four year old Clyde hoists operating the barge mounted derrick shown at right are proof of Clyde's sound engineering, quality construction and long-life dependability! Built in 1934 for The American Bridge Division, U. S. Steel Corp., for the San Francisco Bay Bridge job, these dependable units have been used almost continuously on a wide variety of applications . . . from one 'world's longest suspension bridge' to a new 'world's longest suspension bridge' now being constructed across the Mackinac Straits! Here's a record of an active, profitable life span of more than two decades under severe and exacting conditions!

The engineering and structural advantages of Clyde's complete line of hoists are long-life, quality-plus Clyde features. Their capacity to do a job profitably recommends Clyde for the consideration of the most critical and cost-wise buyer.

Clyde's advanced engineering principles assure long, continuous, economical, safe and easy operation.



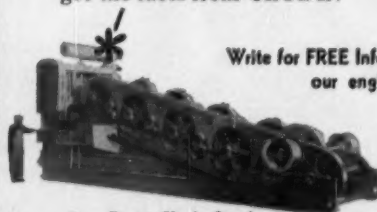
Two Clyde Frame 8 Hoists will operate the Creeper Derrick shown below as it was being erected on the third tier of the main suspension tower of the Mackinac Straits bridge job



Clyde Twin Unit Hoists built in 1934 for American Bridge Company, used on San Francisco Bay Bridge . . . Now in use on Mackinac Straits Bridge.

Here is equipment built to shave critical dollars from competitive bids now and a quarter of a century away!

If your material handling requirements call for dependable equipment, it will pay you well to get the facts from CLYDE!



Write for FREE Information! The services of our engineering department are at your disposal.

Four Drum Clyde Steel Erectors' Hoist with Bull Wheel Swinger

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KERN'S NK3 Precise Engineers' Level. The world famous engineering tool especially designed for accurate leveling.



The NK3 offers over 100 years of Swiss Master Craftsmanship and the latest technical achievements compressed into 4 lbs. of maximum precision, operational efficiency and economy.

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- Coincidence bubble is viewed directly through 30X telescope, allowing constant check on bubble centering while reading rod.
- Ready for use right out of the case. Highest precision leveling with coincidence spirit level and tilting screw. Coated optics give increased brilliance and contrast in the image.

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EQUIPMENT NEWS . . . continued

speed transmission, a 2-speed transfer case, and planetary wheel driving axles. With a 134-hp gasoline engine, the maximum travel speed is 35 mph. For steel erection, the T-20's maximum boom length is 80 ft, with job booms of 10-15-ft in length available. All-wheel 6x6 drive is standard, as well as hydraulic steering booster and all-wheel air brakes. The truck chassis is of all-welded construction. Maintenance of the chassis engine is now easier because the hood has been extended flush with the right forward side of the truck, making the engine more accessible. The crane's upper mechanism, increased from 62 to 75 hp, has air-controlled shaft and drum clutches with power up and down on the load line. Air controlled swing brake and worm gear boom hoist are standard equipment.—Clark Equipment Co., Construction Machinery Div., Benton Harbor, Mich.



BACKHOE AVAILABLE—Two models of the Ottawa Big Muscle backhoe are now available for the Michigan 75-A tractor shovel. The two backhoes are the DX-75A, which digs to a depth of 11 ft, and the EX-75A, with an 8½-ft digging depth. Both can be equipped with buckets ranging from 12 to 36 in. in width. The backhoe replaces the rear counterweight on the tractor shovel. It is powered by the Michigan hydraulic system, which has double-acting piston-type cylinders with chrome-plated rams. Ottawa's patented automatic ejector bucket throws out wet or sticky materials without the loss of cycle time. Only two levers control all actions of the backhoe.—Ottawa Steel Div., L.A. Young Spring & Wire Corp., Box 39, Ottawa, Kansas.

USES SHOCK WAVES—A new-type electric rotary hammer uses shock waves to drill through concrete, masonry, stone, or tough rock. Creating over 36,000 shock waves a min, it cuts clean holes

Ask the man who uses GATES SYSTEMS



We didn't have to ask...

J. C. Wohnlich, General Contractor, Alton, Illinois, told us:

"I would like you to know," he writes, "our results with your GATES FORM TIES. We started using your system in November 1953...and have had a great many compliments on the quality of our work."

"Using GATES VERTICAL ROD FORMING, we saved up to 50% over our former method of forming. I feel we will make additional savings with your Horizontal Rod System."

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a GATES SYSTEM does the job
better—faster—at lower cost!

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THORITE and THOROSEAL furnish office building with *That New Look* plus all- weather protection.



BEFORE

Severe weathering had deteriorated sections of cornices, sills, lintels and ledges. Cracks permitted water penetration, causing damage to interior of building.

All cracks were opened with hammer and chisel, spalled areas cut and cleaned, then patched with THORITE, followed by two brush coat applications of Pearl Gray THOROSEAL.

Brick was left uncoated to develop pleasing contrast. See Circulars No. 16 and 20.



Virginia Electric & Power Company
Richmond, Virginia

THORITE NONSHRINK PATCH
20 minute set patching mortar

THOROSEAL MASONRY SEALER
seals masonry walls
against water and beautifies surface

"How to do it" GET OUR 16
PAGE BROCHURE

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNA. CENTERVILLE, IND.



EQUIPMENT NEWS . . . continued



rapidly without any pressure being exerted by the operator. The hammer, which weighs only 10 lb, is useful for difficult overhead work. It delivers up to 6000 blows per min while drilling 3/16 to 1 1/2-in. dia holes. It is powered by a rugged Thor electric motor that runs on regular 115 v, ac or dc current at 1000 rpm. It sells for \$235, plus bits.—**Demo-Haines Tool Corp., North 10th Machine Works, Enid, Okla.**



RUGGED BODIES—A new rock body, designed to withstand the severe impact shocks imposed by shovel, chute, or conveyor loading of rock and other abrasive materials, is being offered in 6 to 15 yd capacities by Galion Allsteel Body Co. The body features 1/4-in. steel plate construction in the sides, floor, and head. A 1/4-in. wear plate over a 2-in. hardwood cushion protects the floor while a 4x4x1/4-in. reinforced top roll minimizes shovel and loading damage to body sides. For severe service, heavier body shells and wear plates are available. A 15-deg, 24-in. scow end eliminates the need for a tailgate, and body sides slope into the floor at 45-deg angles to keep material from clogging. **Galion Allsteel Body Co., Galion, Ohio.**

(Continued on page 217)



ALEMITE PORTABLE SERVICE STATION

is "Open All Night"

to keep your machines on the job All Day Long!

This service station never closes! It goes *anywhere* it's needed—*whenever* it's needed. Provides fast, modern power lubrication for trucks, tractors—*any equipment*—right on the job.

There's no need to lose valuable machine-hours while equipment is being lubricated. No time is spent traveling to and from field grease shops.

Heavy-duty Alemite Portable Service Stations are equipped with lights for around-the-clock, off-shift service. All the advantages of modern power lubrication are brought right to equipment in the field!

Alemite Portable Service Stations Offer These Four Services



Fast, easy lubrication of track rollers and fittings.



Quick filling of gear housings, transmissions, final drives.



No oil wasted—use exact amount of lubrication required.



Air line equipment for tire inflating, air jet cleaning.

Rugged Alemite Pumps and Hose Reels are mounted on truck beds. They deliver fresh, uncontaminated lubricants direct from "barrel to bearing". . . give you these three important savings:

1. Save Time! Alemite Portable Power lubrication is 64% faster than hand methods! Lubricates on the job—safely—efficiently—economically!

2. Save Money! By cutting expensive lubrication down-time—increasing output of both men and rigs.

3. Save Equipment! By greatly reducing the possibility of costly, time-consuming bearing failure.

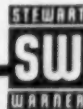
Let an Alemite portable lubrication help keep tight schedules and save money for *you*. Mail coupon for complete information and free illustrated booklet!

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Portable Service Stations

Products of STEWART-WARNER CORPORATION



8 reels mounted on back of truck, plus one water hose on each side, allow Portable Service Station to service two machines at once. Equipped with separate power supply, which furnishes lights for night-time service.

ALEMITE, Dept. F-116

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Gentleman: Please send me FREE information on Alemite lubrication methods that can save me money, plus FREE illustrated booklet describing Alemite Portable Service Stations in detail.

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Company

Address

City

Zone State

STANG SETS A WELLPOINT RECORD

Note shovel marks next to concrete weight in foreground of photo. This clearly indicates how well the earth is stabilized—no sloughing—no extra hand work required.



2300 FEET OF 30 - INCH PIPELINE *laid in one day!*

Visualize more than a mile of header pipe with sufficient Stang Wellpoints to lower ground water level from 6 to 15 feet below subgrade in 2000 foot sections. That approximates the amount of dewatering equipment that Stang utilized in order to maintain a 1650 foot daily average (with a single-day high of 2300 feet) for the first two weeks on the job—amidst almost constant rainfall.

This 150 miles of 30-inch natural gas pipeline through southern British Columbia is

being laid for the Pacific Northwest Pipeline Corporation by Sparling-Davis Co., Ltd. of Canada. In order to complete the 24 miles of dewatering required on the job within approximately 60 working days Stang field engineers contemplate stepping up the working schedule sufficiently to end up with a 2000 foot daily pipeline installation average for the entire job. Don't slow down your production because of groundwater—use Stang Wellpoints and engineering services to protect your job profits!

Putting water
in its place



...anyplace!

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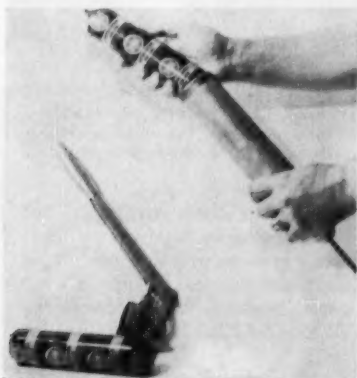
OMAHA, NEBRASKA
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2339 Lincoln Avenue
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TULSA, OKLAHOMA
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NEW BODY DESIGN—Baughman has redesigned the body of its new Model SSY-11 bulk cement carrier to increase its capacity and incorporated a new operating mechanism that features fewer working parts. Discharge is accomplished by means of a 9-in. auger located in the bottom of a body that has 45-deg sloping sides. Body compartments and trip doors help keep the material off the auger and permit selective unloading when necessary. With some materials, unloading speeds of up to 2 tons per min have been recorded. The new unit is 70 in. high and 87 in. wide over-all. It is available in lengths from 10 ft to 34 ft in truck or trailer units fabricated in your choice of aluminum, magnesium or steel. —Baughman Mfg. Co., Jerseyville, Ill.



FASTER LOADING—A new 12-oz cartridge for RPM grease provides faster, simpler, and cleaner loading of grease guns. Taking a leaf from the food processing industry, the grease is enclosed in Saran wrap—and looks more like packed sausage than a petroleum product. In fact, the cartridge is produced

Drivers last longer...



when heavy-duty trucks

use J-M Brake Blocks



Experienced operators know that when their vehicles are equipped with Johns-Manville Brake Blocks they can handle crushing loads without personal danger.

That's because these rugged, durable J-M Brake Blocks are engineered for the job . . . and designed for dependable performance plus maximum service life on trucks, shovels and heavy machinery.

They are "standard parts" on many famous makes of heavy-duty units. For fast, easy replacement, they are now available in Johns-Manville Assembled Sets that put new safety into your equipment.

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Johns-Manville Industrial Friction Sets are available in a wide range of molded or woven, rigid or flexible asbestos materials.



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for easier,
faster
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**NEW LIGHTWEIGHT
HYDRAULIC BENDER
BY GREENLEE**

full 90° bend with one stroke
of the ram . . . easy portability
. . . extra versatility



Here's the kind of real portability you've been looking for in a bender for 1/2" to 2" pipe and conduit. Using light, but strong, aluminum alloy for many parts, the new GREENLEE No. 880 Hydraulic Bender is unusually *lightweight*, yet extra rugged, fast, powerful

. . . produces 15 tons of ram force! One man can easily carry and operate it to quickly make uniform bends. Complete 90° bends can be made with one ram stroke. Separate two-speed hydraulic hand pump and bending ram simplify handling and setup. Easily operated by hand or may be teamed with a GREENLEE Power Pump for fast production jobs.

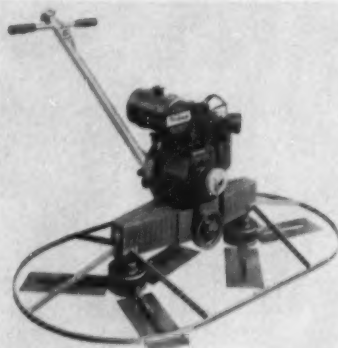
Attachments also available for bending thin-wall conduit, tubing, bus-bars. Get complete details on how to speed jobs and get better results with the new GREENLEE No. 880 Bender. Write for Bulletin E-217.



GREENLEE TOOL CO.
2191 Columbia Ave., Rockford, Illinois

EQUIPMENT NEWS . . . Continued

in a modified sausage packing machine. When loading, the contents of the package can be stripped directly into the gun barrel or the entire sausage may be inserted in the gun. When the entire package is loaded in the gun, the top of the cartridge is punctured or cut off, the head of the gun is replaced, and the unit is ready for use. It comes in cases of 24 cartridges.—**Standard Oil Co. of California**, 225 Bush St., San Francisco 20, Calif.



TWIN TROWELS—The Whiteman Twin floating-finishing machine employs two sets of counter-rotating trowels that enable the operator to cover a 5-ft wide area with one pass. The counter-rotating action prevents torque, and the wide pattern shows up and corrects irregularities instantly, according to the manufacturer. The machine comes with combination trowels for either floating or finishing, and trowel pitch adjustment is made easily by turning a knob at the top of the handle when the machine is in motion. It is equipped with ball-thrust bearings to make trowel adjustment easier, and Timken bearings are used in the gear case.—**Whiteman Mfg. Co.**, 13020 Pierce St., Pacoima, Cal.



PORTABLE STEAMER—To provide close control for pile driving applications, the new Cleaver-Brooks PS-125 portable steamer provides full modulation from low fire to high fire by adjusting just one control. The PS-125 delivers 4300 lb of dry steam per hr from a

**HOW TO HANDLE
WET JOBS**

**WELLPOINTS
DRY TUNNEL...
25-FT SUCTION LIFT**

North Point Road Tunnel for 96 In. Water Line, at Sparrows Point, Md. Contractor: C. J. Langenfelder & Son.



DOTTED LINES show path of wet tunnel. Pre-drainage problem: Could a wellpoint system, placed at *street level*, remove 12 ft of groundwater with 25-ft suction lift? Before you say "impossible," see below.



DRIED PERFECTLY, by Griffin method, without interrupting heavy traffic to nearby Bethlehem Steel plant.

As photo shows, points did not cross highway but were placed along its sides and thus performed their unusual feat despite a huge gap in-between. What problem can advanced Griffin methods solve for you?

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Hydraulic torque converters and power shift transmissions meet specialized equipment needs

Harmonizing engine characteristics with your drive problems is a specialty of Westinghouse hydraulic drives engineering. The result is a hydraulic drive that assures maximum *work output* of your equipment, simplifies operator training, and reduces maintenance.

Westinghouse hydraulic drives are currently being used on heavy-duty construction equipment, off-highway trucks, special-purpose military vehicles and oil well servicing rigs.

The Westinghouse torque converter is based on the Schneider single-stage system which provides highest efficiency over an extended operating range.

Because Westinghouse manufactures drive components, and not end products, you are assured complete confidence on your advanced design planning. For more information write Westinghouse Electric Corporation, Gearing Division, Pittsburgh 1, Pennsylvania.

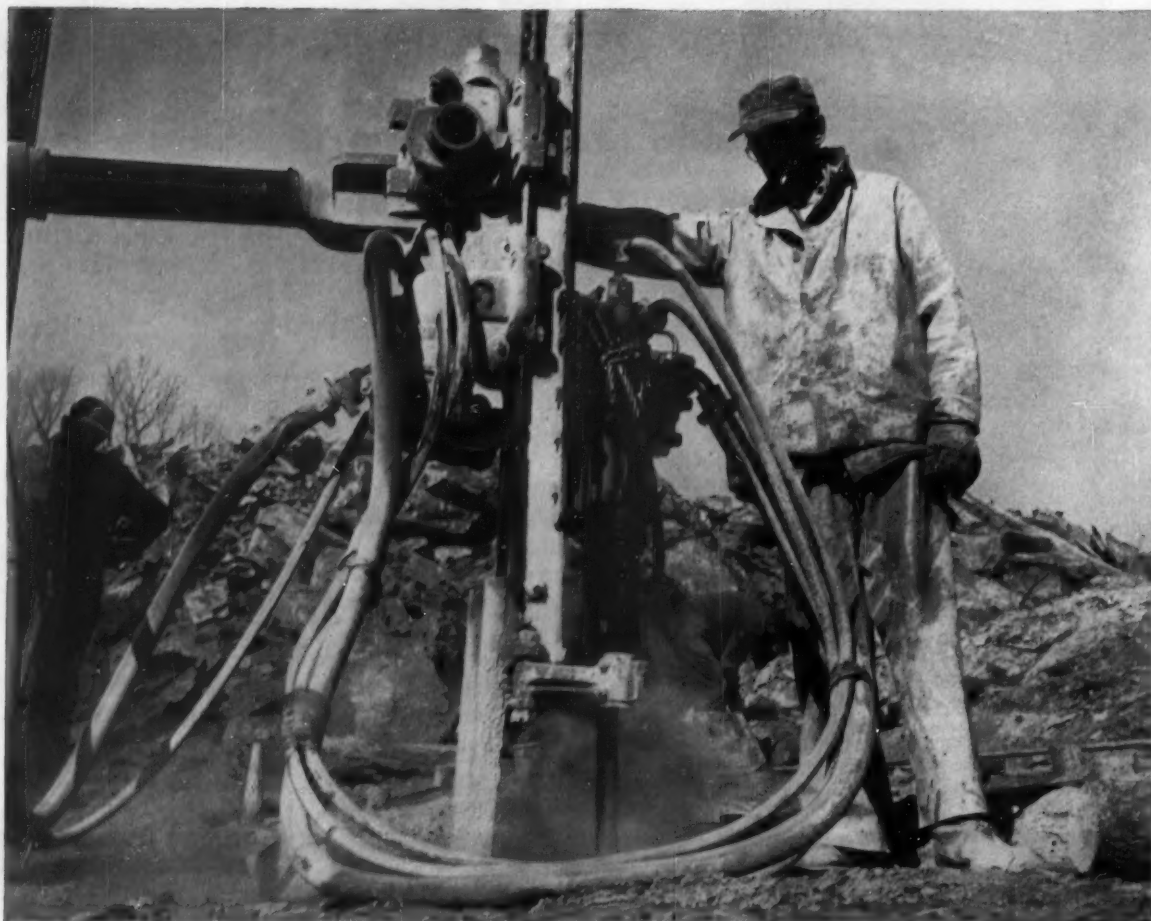
J-07353-X

Developed to meet your special needs in earth moving, construction and materials-handling equipment.

(1) Westinghouse single-stage torque converter showing simplicity of basic parts. (2) Matching equipment requirements, Westinghouse engineers analyze advance design planning; result (3), a typical Westinghouse torque converter—power shift transmission package.



WATCH WESTINGHOUSE!
WHERE BIG THINGS ARE HAPPENING TODAY!



Bethlehem Hollow digs into medium-hard rock at Dow Air Field, Bangor, Me. Contractor: J. R. Clanchette Construction Co., Bangor. The drill steel was reconditioned by Bicknell Manufacturing Co., Rockland, Me.

Rock-Removal for Air Base Runway

Because the existing runways at Dow Air Field, Bangor, Maine, were not long enough to accommodate some of the heavier types of military aircraft, the U. S. Air Force recently decided to construct a new runway, with the work being done by the Army Engineers. Bethlehem Hollow Drill Steel was used exclusively in making the blast holes.

The project called for the removal of a hill, containing about 500,000 cu yd of medium hard rock. This was accomplished by drilling 24-ft blast holes with 1¼ in. and 1½ in. round Bethlehem Hollow, fitted with carbide-insert bits, and mounted in jackhammers and drifters. The performance of the drill steel was excellent.

Bethlehem Hollow provides dependable service in just about any type of rock-removal operation you can name. Here's why: It's rolled from tough

fatigue-resisting steel. It has a wide quenching range, which makes it easy to heat-treat for the proper balance of toughness and wear-resistance. Moreover, it always provides long-wearing threads and strong shanks.

ALL STYLES AND LENGTHS

Bethlehem Hollow is produced in two grades, carbon and ultra-alloy, in rounds, hexagons and quarter-octagons. It is furnished regularly in popular lengths of from 18 ft to 25 ft. For holes of special depth, longer lengths can be supplied. When you talk with your converter, tell him you want Bethlehem Hollow on your next drilling job.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL CARBON AND ULTRA-ALLOY



cold start, enough steam to power single or double acting hammers at their full rating. The steamer is fully insulated with fibreglass to meet cold weather code standards, and it employs an oil fired air atomizing burner similar to one used on industrial boilers. The self-contained boiler carries its own fuel supply—132 gal of No. 2 oil—in two fender tanks. The unit rolls to the job towed behind a truck or it can be mounted on skids and easily carried. The engine is rated at 22 hp continuous duty at 1800 rpm, and a hand throttle controls rpm at speeds below 1800 rpm. The unit will also provide steam for heating asphalt, winter thawing, or for cleaning equipment. — **Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.**



POWER-FLOW GRADER—A torque converter drive train and a 27% increase in engine power have been added to the Adams 660 motor grader. Called the Power-Flow 660, the grader teams a 190-hp diesel power plant with a single-stage torque converter and four-range constant mesh transmission—a combination that triples the previously available torque and adds considerably to the unit's versatility. The grader has a rocker-type pedal located on the cab floor that allows the operator to make changes in travel from forward to reverse, and vice versa, without hand shifting. To set the grader in forward motion, in any previously selected range, the operator has only to press the rocker pedal with his toe and to shift to reverse he rocks his foot on the pedal and applies pressure with his heel. This feature leaves the operator's hands free to manipulate steering, blade, and other controls. Another feature is a tail shaft governor that automatically adjusts engine speed to meet varying resistances. The new power train provides four speed ranges from

LOOK TO **WILLSON** for another new development in head protection!



**NOW—SUPER-TOUGH
PHENOLIC
SAFETY HATS AND CAPS**

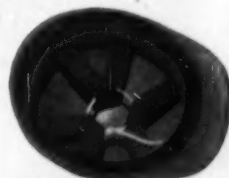
Strongest Made!

See how it's built up from 24 individual die cut pieces into a sturdy Phenolic pattern that withstands repeated 80-foot-pound drop ball tests without even fracturing!



LACE-IN SUSPENSION

Both hats and caps are available with convenient lace-in suspension feature. Easily adjusted for snug comfort to any head size.



SNAP-IN SUSPENSION

Handy Center-Tie snap-in type suspension is also obtainable in Super-Tough hats and caps. Willson's exclusive patented "Geodetic Suspension" and Pneumatic Headband can be had in any style!

FROM THE WILLSON RESEARCH CENTER now comes the "Phenolic" line of scientifically designed safety headgear that meets all specifications with ease!

In this Super-Tough line are safety developments so outstanding that you'll find it offers unequalled value. For instance, the famed "geodetic suspension" and the unique pneumatic headband are obtainable in both adjustable *lace-in* and *snap-in* types of hats and caps.

Ask your Willson distributor to demonstrate the heavy duty Phenolic line that combines comfort and maximum head protection. Or write for latest "Super-Tough" bulletin describing them in detail.

WILLSON



Over 300 safety products carry this world-famous trademark

**PRODUCTS DIVISION
RAY-O-VAC COMPANY**

141 Thorn Street, Reading, Pennsylvania

HERE'S HOW TO CUT CONCRETE FORMING COSTS:

Ellis METHODS prove, on jobs
all over the U.S. and Canada, that
the **SIMPLEST** is also the **BEST!**

**NO TUBING,
NO SCREWS,
NO SLOW ASSEMBLY... JUST SIMPLE ERECTION
THAT'S BOTH FAST & SAFE!**



Visit your nearest construction job using Ellis Methods of concrete forming. Once you see how smoothly and simply Ellis forming assemblies go together, you will understand why so many contractors are sold on Ellis Methods. Huge savings of time, labor, and lumber mean more profits on concrete construction. Forming lumber can be re-used many times. Write, giving specifications of your next job, for suggested Ellis Methods that can save you money.

ELLIS MFG. CO., INC. 211 N.W. 4th ST., OKLAHOMA CITY, OKLA.

L/P GAS **SALAMANDERS** by **JACKSON**



**Oldest and Largest Wheelbarrow
Maker in America**

Two improved models combine efficiency and economy. Inside baffle produces even flow of heat. Dual purpose shield spreads heat, eliminates hot spot under unit. Holes in feet permit fastening. Equipped with U/L approved low-pressure regulator, hose assembly and fittings. Automatic safety shut-off controls available and recommended for unattended operations.

Model 500—
50,000 BTU per hour
Model 750—
75,000 BTU per hour

ASK YOUR CONTRACTOR EQUIPMENT DISTRIBUTOR

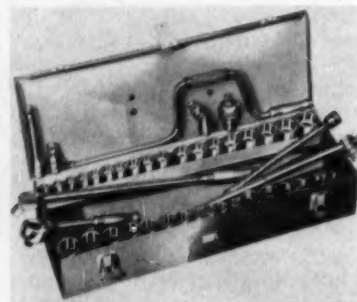
OTHER FAMOUS JACKSON PRODUCTS



Jackson
MANUFACTURING COMPANY
Harrisburg, Pa.

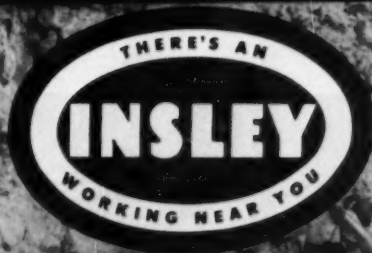
EQUIPMENT NEWS... Continued

a creeping .23 mph to 27.4 mph in forward and from .22 to 24.4 mph in reverse. Engine options for the grader are either the Cummins HRFBI 600 or the GM 6-71, both rated at 190 hp.—LeTourneau-Westinghouse Co., Peoria, Ill.



SOCKET SET—A versatile set of 1/2-in. square drive sockets has been developed by Snap-On Tools Corp. The set of heat-treated alloy steel sockets comes in a compact, compartmented metal box. Sockets are thin-walled so that they can be used in close quarters. Besides the sockets, the set includes a 10-in. ratchet handle, ratchet adaptor, 18-in. nut spinner, 15-in. sliding "T" handle, universal joint, 19 1/2-in. speeder, and three extension bars. Sockets include 11 deep or bolt clearance-type, double hexagon sockets ranging from 1/2 to 1 1/4-in. wrench sizes; 18 standard double hexagon sockets ranging from 1/2 to 1 1/4-in. wrench sizes; and six single hexagon Flexockets with wrench opening of 9/16 to 7/8-in.—Snap-on Tools Corp., 8028 28th Ave., Kenosha, Wis.

SPIRAL NAILS — The threaded nail has been recognized for some time as having a superiority in holding power over straight-shank nails, but its use has been restricted because of costly production methods. Now, however, Jones & Laughlin have entered into a licensing agreement with the Steel Co. of Canada, Ltd., which has developed a manufacturing process that permits the nails to be priced at a lower price per nail than common nails. While the price per lb is still higher than common nails, there are more Ardox spiral nails per lb than there are per lb of common nails. As an example, there are 47 straight-shank 16d nails in a per lb as compared with 65 nails per lb of Ardox nails—an increase of 38% which means a price reduction of 5% per nail. Be-



the INSLEY type WB

full heavy duty 1 yd. Rock Shovel

- Deck and machinery side stands constructed as a one piece weldment.
- Heavy gauge, all steel cab, $\frac{3}{8}$ " protective rear plates.
- Hook and load roller construction.
- Internal expanding mechanical clutches with booster operated drum clutches.
- Independent boom hoist.
- Gasoline, diesel or electric power.
- Crawler, self-propelled Maxi or Lorry (truck) mounting.
- Fully convertible to all front end attachments.

With optional features for any excavator-crane job:

Power Load Lowering ● Independent Travel ● Third Drum ● Fluid Coupling or Torque Converter

INSLEY MANUFACTURING CORP. • INDIANAPOLIS, IND.
Wholly owned subsidiary / THE MAXI CORP. • LOS ANGELES



Haul, Dump and Spread

Any Material
You Can
Top Load

USE

**C & D
Movall**



Movall's scraper-in-reverse design pushes load straight back. There's no danger of tipping. It's the only wagon that does work of both an end-dump and a bottom-dump.

This rugged wagon uses a unique dozer-type ejector that positively pushes out all materials, from sticky clay to shot rock, cleanly and quickly (25-yd. loads in 12-14 seconds). Movall dumps behind wheels so you can spread load like a scraper, with depth controlled (3 to 18") by tractor speed...or dump on grade, over edge of fill, and into hoppers at controlled rate; also unload while turning at end of road fill.

Built to take shock loads of 6-yd. buckets. Massive box-beam construction of high alloy steels prevents body spread, or damage to top rails.

Available for all makes of rubber-tired tractors. Movalls are made in sizes from 12 to 26½ cu. yds., truck; 22 to 45 tons rated load, for:



Allis-Chalmers T5300 and T5360

Caterpillar DW20, DW21, DW15, DW10

Euclid TDT, FDT, LDT

International 75 and 55

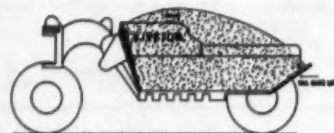
LeTourneau Super C

M-R-S — all models

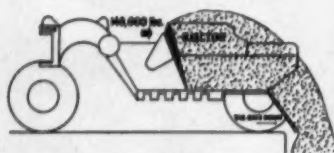
Wooldridge — all models

Why tie up money in single-purpose units when you can get Movalls to use with any available rubber-tired tractor that hauls your scrapers? Buy Movalls where you buy your tractor...ask the dealer for a demonstration on our buy-and-try plan, or write C & D Division, Yuba Manufacturing Co., 701 East H Street, Benicia, California. Phone 623.

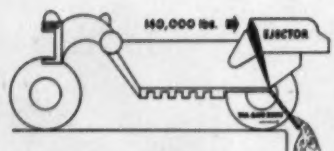
How It Works



LOADED



DUMPING



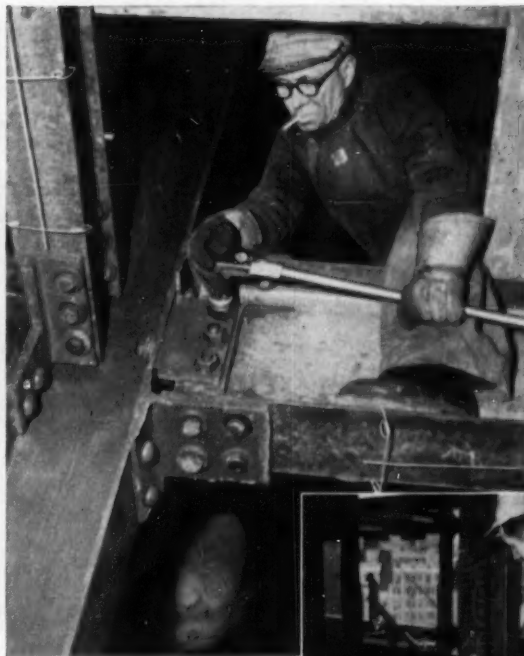
EMPTY



sides having from 50 to 200% greater holding power, depending on the type of wood, the Ardox spiral nail is said to be easier to drive and to reduce wood splitting. The new process uses stiff stock wire that is pre-threaded, cut, and pointed and headed into nails.— Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.



TWO-IN-ONE—The all-aluminum Lute-O-Rake is a combination asphalt lute and rake. One edge of the T-shaped extruded aluminum blade is straight, while the other side has teeth like a rake. Seven and 10-ft handle lengths are available, and blades are either 30 or 36 in. long. Braces and handle are slotted and lock-bolted to the T-bar of the blade so that the blade will not come loose. All stress points are reinforced. — Miller Spreader Corp., 4020 Simon Rd., Youngstown, Ohio.



Photos courtesy of Russell, Burdall & Ward Bolt and Nut Co.

A Snap-on Extra Heavy-Duty Ratchet Wrench provided ample tightening leverage and fast nut turning where bolt locations hindered the use of power tools.

An inspector okays bolt tensions after checking for accuracy with a Snap-on torquemeter, which measures the exact torque applied to a bolt.



**Snap-on
Tools**

PULL 'EM TIGHT . . . TORQUE 'EM RIGHT on New York's First Building with High-Strength Bolts

Eighteen stories above New York's Park Avenue, where a slip could be serious, steel workers depended on Snap-on Extra Heavy-Duty Wrenches to help erect the city's first high-strength bolted building. This construction method speeded assembly, permitted use of smaller crews than needed for riveting.

Snap-on tools handled their share of the work, just as they do on a wide range of big construction projects. Men who work on these jobs know they can depend on Snap-on tools to give the leverage needed to tighten these bolts to proper tension, or to break loose rusted nuts and bolts on maintenance operations.

Each of our 48 branches carries complete tools stocks. Write for catalogs and branch addresses.

*Snap-on is the trademark of Snap-on Tools Corporation.

SNAP-ON TOOLS CORPORATION

8042-K 28th Avenue • Kenosha, Wisconsin



GET THE JOB DONE

Faster : : : at Lower Cost



Air lines, water lines, dredging lines or vent lines — wherever there's a job for pipe, you'll be time and money ahead with dependable Naylor Spiralweld.

Because it is light in weight, this distinctive pipe is easier to handle and install. You don't have to "baby" it because Naylor pipe is stronger and safer due to the exclusive lock-seamed, spiralwelded structure.

Installation is further simplified and costs reduced when you use the one-piece Naylor Wedge-Lock coupling to connect Naylor lines.

Get the facts today on this proved, practical way to speed up pipe line operations in construction service. Ask for Bulletin No. 507.

NAYLOR PIPE



NAYLOR PIPE COMPANY

1266 East 92nd Street
Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

New

Publications

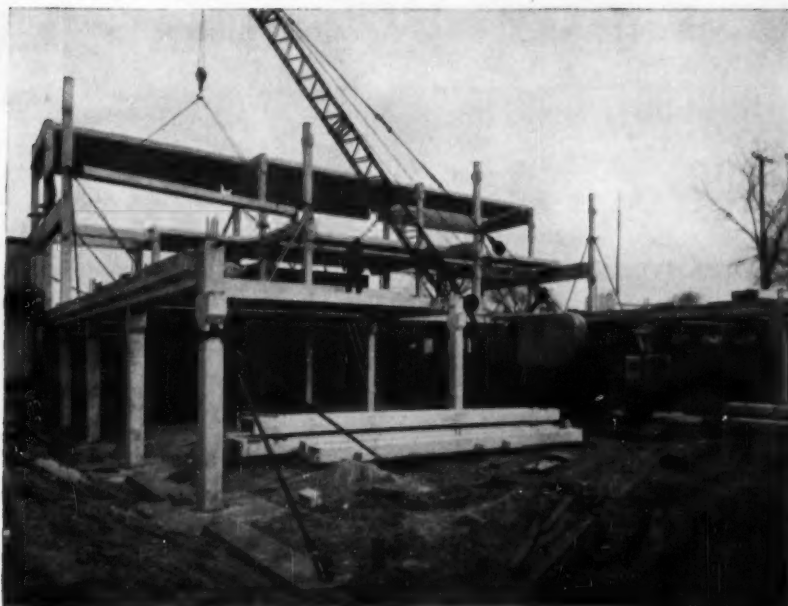
These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

GENERATOR SETS—The Detroit Diesel Engine Div. of General Motors has issued a new brochure describing its line of electric generator sets. The brochure includes specifications and illustrations of over 25 radiator and heat exchanger-cooled models ranging from 20 to 245 kw. Both 50 and 60 cycle models and direct current units for emergency and continuous use are represented.—**Detroit Diesel Engine Div., 13400 W. Outer Drive, Detroit 28, Mich.**

CAT INSTRUCTIONS—An operator's guide for Caterpillar wheel tractors and scrapers describes the proper operation of rubber-tired earthmovers. Detailed data on loading, hauling, dumping, and returning are included as well as an explanation of proper shifting of scraper and tractor controls. The booklet also includes an easily understood checklist of service procedures that should be performed by the operator before he starts his work day.—**Caterpillar Tractor Co., Peoria, Ill.**

HARDSURFACING INFO—Effectiveness of hardsurfacing in extending the life of equipment continually subjected to wear and impact in cement and aggregate plants is discussed in a brochure published by the makers of Ranite hardsurfacing welding materials. Called "Cement and Aggregate Plants Profit by Hardsurfacing," the brochure contains case studies of hardsurfacing uses and photos of actual applications. Examples include hardsurfacing a gyratory crusher mantle, crusher rollers, mill hammers, screw flights and other crusher parts.—**Rankin Mfg. Co., Dept. R-2, 616 S. Marengo Ave., Alhambra, Calif.**

MATERIALS HANDLING—A new 12-p booklet offered by American Tractor contains helpful suggestions on mechanized handling of



The addition is approximately 91 ft. x 114 ft. with 16 ft. x 30 ft. bays. Prestressed beams run the 114 ft. length, spanning 16 ft. over the precast columns. Prestressed channel slabs of 12 in. depth span the 30 feet between the beams at floors and roof.

Owner: MINNESOTA RUBBER and GASKET CO., St. Louis Park, Minn.
 Architect: MAGNEY, TUSLER & SETTER Minneapolis, Minn.
 Precast concrete manufactured and erected by: PRESTRESSED CONCRETE, INC., St. Paul, Minn.

PRESTRESSED AND PRECAST STRUCTURAL CONCRETE FRAMING saved time and money for Minnesota Rubber and Gasket Company

The new three story addition to the St. Louis Park, Minnesota, plant of Minnesota Rubber and Gasket Company is constructed entirely of precast concrete columns and prestressed beams, floor channels, and roof channels. These modern materials cut framing costs 20%, permitted 4 months earlier occupancy and eliminated expensive fireproofing.

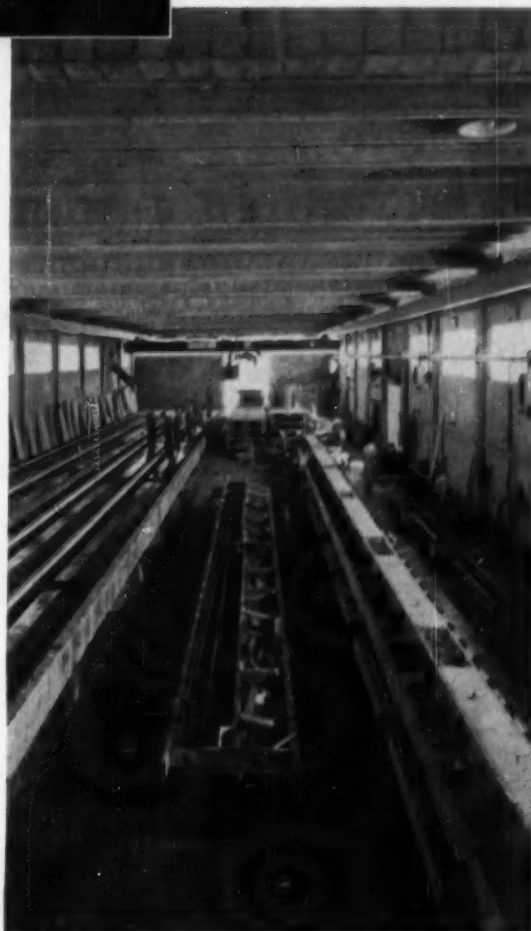
LEHIGH EARLY STRENGTH CEMENT saved time and money for Prestressed Concrete, Inc.

All structural units were cast in the modern plant of Prestressed Concrete, Inc. Using Lehigh Early Strength Cement and hot water curing, the concrete reached 3500 PSI in 12 hours. As a result, the manufacturer gained maximum production efficiency and economy through early removal of units and quick reuse of forms.

Whatever your cement requirements, there are Lehigh Cements to fit them. And remember, somewhere on nearly every job, Lehigh Early Strength Cement will save time and money.

- LEHIGH EARLY STRENGTH CEMENT
- LEHIGH PORTLAND CEMENT
- LEHIGH MORTAR CEMENT
- LEHIGH AIR-ENTRAINING CEMENT

LEHIGH PORTLAND CEMENT COMPANY
 Allentown, Pa.



Interior view of Prestressed Concrete's casting plant. Four channel beds at left are 200 ft. long. In center is bed for precasting reinforced beams. Next to the far right is a 100 ft. bed for prestressing beams. At far right is a form for precasting columns.

**Nylon cord tires reduced
off-the-road tire failures...**



NOW NYLON CUTS TRUCK TIRE COSTS, TOO



**HANS G. BINGHAM, Shop Supt.
Dave L. Brown Company
Chattanooga, Tenn., reports**

"We're switching our 147 pieces of rolling construction equipment to nylon cord tires. We've tried nylon cords for just a year, but that's enough to convince us they're big money savers. They last about 50% longer than our best standard tires. Really stand up to those twenty-ton loads... even on steep grades and rough terrain.

"In our business, road delays often mean the dif-

ference between profit and loss. Nylon cords have reduced costly tire-failure delays approximately 50%."

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads—lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON for TIRE CORD



BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY



**NOW, IN PASSENGER-CAR TIRES, TOO... THE STRENGTH AND TOUGHNESS OF
NYLON... FOR UTMOST SAFETY, SUREST PROTECTION AGAINST TIRE TROUBLE**

NEW PUBLICATIONS . . .

Continued

construction materials. Reprints from job-story advertisements that have appeared in various trade publications during the past year are used to explain how contractors have used crawler-mounted TerraTrac fork lift units with quick-change attachments to cut handling costs and to speed up the movement of materials in mud or over rough terrain. The machine described is a 3,500-lb capacity unit with a maximum lift of 21 1/3-ft. —**American Tractor Co., Churubusco, Ind.**

ROCK DRILLS—A new 12-p bulletin describes the LeRoi-Cleveland rock drill line. The three-color bulletin, designated AT111B, uses photos and line drawings to illustrate the company's line of breakers, sinkers, clay spades, tampers, and wagon drills. Individual pages cover the design, operation, and maintenance features of the tools. The lubrication system, drill and blow actions, and valve and piston design are described in detail.—**LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.**

ASBESTOS MATERIALS—"Industrial Friction Materials" is the subject of an illustrated 16-p booklet just issued by Johns-Manville. It covers asbestos brake blocks, linings, and clutch facings. The booklet describes moulded asbestos friction materials, woven materials and assembled sets for servicing industrial machines. A section on design data, and information on pertinent characteristics of various friction materials is included.—**Johns-Manville, 22 E. 40th St., New York 16, N.Y.**

BIG CRAWLERS—The virtues of big crawler tractors are discussed in "Big Tracks," an illustrated booklet published by Caterpillar. Features of the design and construction of the D6, D7, D8, and D9 are described, and a section is devoted to matched tools for these units.—**Caterpillar Tractor Co., Peoria, Ill.**

BOLTING PROCEDURES—Skidmore-Williams' wall chart gives complete procedures for tightening high-strength bolts, including the latest techniques studied by the Research Council. Divided into sections, the chart covers methods

Everything



JACKSON PAVING TUBE
(INTERNAL TYPE)



JACKSON SIDE FORM
VIBRATOR



JACKSON VIBRATORY
SCREED



JACKSON POWER PLANT

FOR MORE PROFITABLE PAVING



Jackson Multiple Vibratory Compactor

MACADAM BASE COURSES, SUB-BASES, SOIL-CEMENT PAVING, FILLS

The JACKSON MULTIPLE COMPACTOR has now thoroughly demonstrated that it is by far the most advantageous equipment for achieving or exceeding specified densities in rock, slag, sand, gravel . . . all granular soils used in waterbound and penetration macadam construction, and in filling the voids in rock and slag courses with fines. The Jackson does it in about half the time required with other types of equipment. It is equally efficient for consolidating large granular soil fills such as bridge approaches and kindred projects.

JACKSON INTERNAL TYPE PAVING TUBE

Supplied with extraordinarily powerful motors, no concrete highway or airport paving job is too tough for this improved machine. Tubes vibrate deep in concrete, quickly plasticizing harsh dry mixes in slabs to 24" thick and as wide as 25'. It saves time, saves cement; provides greater density and compressive strength. Cuts spreading costs where no spreader is used. The tube is made up of one unit as shown for each 5'-0" (maximum) of slab width. Usually attached to front of finisher and controlled by finisher operator. Power is supplied by a Jackson Power Plant mounted on the parent equipment. Use of a JACKSON Side Form Vibrator on standard finisher assures thorough consolidation and plasticity of concrete at side and center forms — with no "missed" spots. Labor savings effected quickly repay cost of equipment.

MUNICIPAL PAVING — BRIDGE DECKS, ETC.

For jobs of this type a JACKSON Vibratory Screed and Portable Power Plant is the most convenient, productive and inexpensive outfit you'll find anywhere. Strikes off to any crown, undercuts at curb and sideform, works right up to and around all obstructions. Two men easily handle it on all slabs up to 30 feet wide, and it may be rolled back for second passes on 4 rollers.

PORTABLE POWER: Thoroughly reliable, time-proved plants in capacities of 1.5 to 7.5 KVA . . . equipped with permanent magnet generators requiring no maintenance or adjustment. They provide both single and 3-phase 120V., 60 Cy., AC and may be used for lights as well as operating all JACKSON equipment.

FOR SALE OR RENT
AT YOUR JACKSON
DISTRIBUTOR

JACKSON VIBRATORS, INC.
LUDINGTON MICHIGAN



SAFETY'S ALWAYS IN SIGHT

Ever worried about your crew forgetting the rated capacity of a block? You're free from worry and they're free from danger with Crosby® "Load-Rated" Blocks because the load capacity is embossed in the side plates!

A quick glance shows what the limits are—no chance to overload the block by mistake. Crews the world over are protected by genuine Crosby "Load-Rated" Blocks—are yours?

®REGISTERED TRADEMARK

THE RIGHT COMBINATION



An exacting combination of design, steel and drop forging goes into Laughlin Shackles. A combination that results in maximum strength without brittleness that can result in fracture under shock load or in extreme cold! Pins used in Laughlin Shackles are forged from the same high quality steel—their extra hefty design makes them safer when shock loads accidentally occur. When you see the famous Laughlin trade mark on shackles (and all other Laughlin fittings), you're seeing the mark of safety! Your nearby distributor has shackles in sizes from $\frac{1}{16}$ " to 3".

LAUGHLIN LINKS INSTALLED QUICKLY

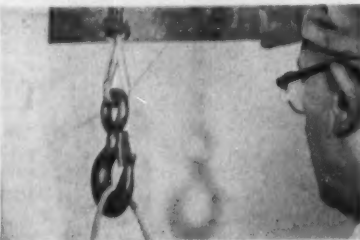
Lower downtime—fast changeover is reported by companies using super safe Laughlin Double Clevis Links to couple standard and alloy chains to fittings. Users everywhere have cut out expensive, time-consuming welding and blacksmithing in favor of simple installation. Laughlin's heat treated



Double Clevis Link attaches $\frac{1}{4}$ " to $\frac{1}{2}$ " chain to rings, end and sling links, eye hooks, pad eyes, tractor eye bolts and other fittings.

The world's most complete line of fittings for chain and wire rope is described in the catalog available from your distributor.

LOADS STAY PUT!



Anyway you handle it—rough or easy—your load won't come off a Laughlin Safety Hook until you release it! The hook is drop forged and heat treated. The fool-proof latch mechanism is made of long life stainless steel or bronze—it'll never rust, never jam! See your Crosby-Laughlin distributor for information on sizes and capacities.

Stocked and sold by leading distributors everywhere

CROSBY-LAUGHLIN Division

American Hoist and Derrick Company
FORT WAYNE 1, INDIANA

NEW PUBLICATIONS . . .

Continued

of checking high-strength fasteners, correcting calibration of torque control and conventional impact wrenches, and instructions on the actual tightening process. The chart is available free to interested parties.—Skidmore-Wilhelm Mfg. Co., Cleveland 21, Ohio.

GM TURBOCHARGERS—A well-illustrated brochure describes GMC Turbopower diesels. Specifications of industrial and marine models ranging from 159 to 300 brake hp are described, along with details of design and performance data.—Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.

SAFETY DATA—Written by staff engineers of the National Safety Council, and reviewed by safety experts, the "Supervisors Safety Manual" provides project managers and foreman with a comprehensive guide to many of the phases of safety on the job. The manual can be used as a text for group training, or as a reference work to solve day-to-day safety problems. It includes material on the human side of safety—such as how to maintain interest in accident prevention, first aid, and fire prevention. The manual, 354 pages long, is well-illustrated. It is available to Council members for \$3.25 and to non-members for \$6.50.—National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

EUC SCRAPERS—Three new catalogs describe the overhung engine line of Euclid scrapers, including models S-7, S-12, and S-18. Each of the three-color catalogs contains eight pages of cut-a-way views of major components as well as on-the-job photos. Condensed specifications and features of Euclid's Torqmatic Drive are included.—Euclid Div., General Motors Corp., Cleveland 17, Ohio.

GENERATING PLANTS—A new 8-p, three-color catalog describes the complete line of Onan electric generating plants, including one-cylinder, air-cooled models; two-cylinder air-cooled models; four-, six- and eight-cylinder, water-cooled and air-cooled diesel models. Complete specifications, available accessories and information on Onan's new Vacu-Flo cooling system are included.—D. W. Onan & Sons, Inc., Minneapolis 14, Minn.



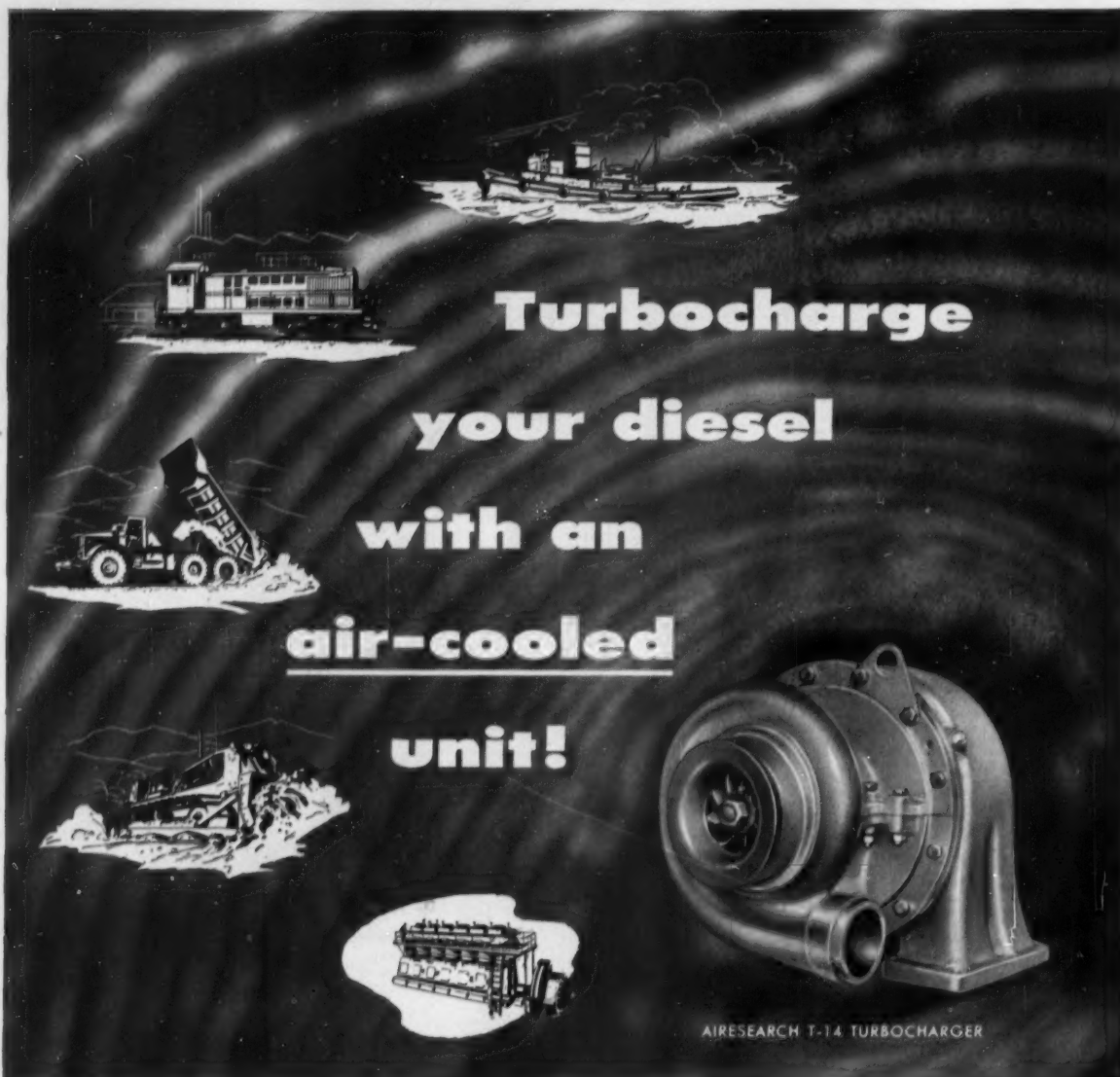
Wire Rope at Work—In constructing a portion of New Jersey's North-South Freeway, Route 42, the builders were faced with a difficult drainage problem. In boglands near Philadelphia, it was necessary to drive sand drains into the earth, then place cross-drains near the surface and top everything with overburden. The weight of this top layer "squeezed" the bog and forced water up the sand columns and into the cross-drains.

Hercules Concrete Pile Co. contracted to install 500,000 lineal ft of drainage system. The photograph above shows one important phase of the work—filling a casing with sand. The task of ramming the casings into the ground was handled by hard-hitting pile-drivers. To lift the bulky rams for every stroke, the rigs were fitted with Bethlehem Purple Strand—a wire rope so tough that it stood up easily under the merciless demands of the job.

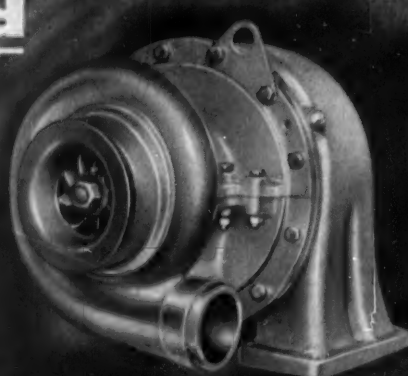
Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributors:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING





Turbocharge your diesel with an air-cooled unit!



AIRESEARCH T-14 TURBOCHARGER

AiRESEARCH turbochargers increase power to the full capacity of the engine, yet require no extra plumbing and put no added burden on the cooling system.

The diesel industry generally has recognized the fuel-saving, noise and smoke reducing and power-adding advantages of turbocharging. But there are important differences between turbochargers. Some are difficult to service and add complicated plumbing because of the necessity for water-cooling.

All AiResearch turbochargers, from the smallest units for mobile equipment to the large, stationary power plant models, are air-cooled. Each contains a removable rotating assembly which simplifies maintenance, especially in the

field. Their modern design resulted from the most extensive experience in the field of small turbomachinery in America.

We invite your inquiry on their application to your diesel equipment.

BASIC SPECIFICATIONS FOR AIRESEARCH TURBOCHARGERS

MODEL	T-10	T-14	T-15	T-30-2	T-30-6
Diameter — in. nom.	9	11.5	15.25	15.25	16
Length — in.	9	14.12	16.75	17.25	21.75
Weight — lb.	40	95	125	135	195
Output — lb./min. (Standard Conditions)	25-40	35-65	35-65	70-95	115-175



AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

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Short 180° turns



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Model	Capacity	HP	Overall Length	Width req'd. for 180° turn	
				Travel position	Dump position
D	11 tons	138	24'10"	24'8"	18'8"
C	22 tons	208	29'9"	28'8"	20'8"
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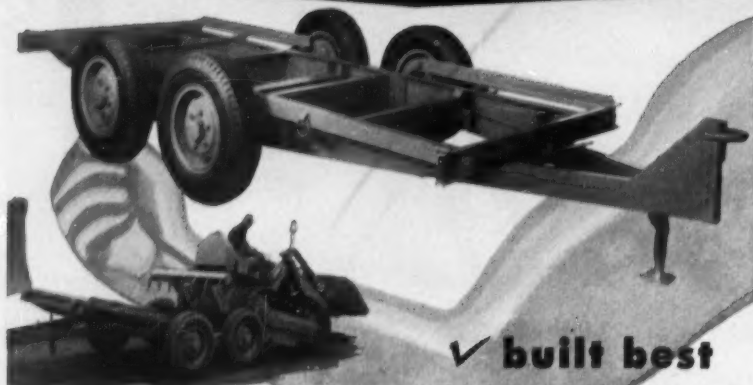
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Skilled mechanic putting finishing touches to a National Torque Converter shaft assembly prior to its final installation in a housing assembly, after which the unit will receive its final tests.

The National Torque Converter is a dependable "constant horsepower" unit

Simple design, rugged and durable . . . precision parts assembled by skilled, experienced mechanics . . . standard and special tests of parts, of sub-assemblies, and of completed torque converters

That is why National Torque Converters provide uniformly smooth transmission of power from engine or motor to the job or load. All the shock of quick starting and fast acceleration of the load is absorbed hydraulically by the torque converter. This enables the engine to attain its optimum speed quickly and to deliver its full horsepower constantly . . . and without lugging or stalling.

Result: Job or work cycles will be completed faster

and your equipment will deliver more work per unit per operator per day . . . every day . . . with minimum maintenance . . . with extended service life. It can be truly called a "constant horsepower" device.

Each National Torque Converter is a complete, integrated unit tailored to the application. And with a choice of 6 basic hydraulic circuit sizes, each with a range of input ratings, the National Torque Converter can be matched exactly to prime movers of 100 to 1000 hp in a wide variety of industrial applications; construction, excavating, drilling, earth-handling, logging, and mining equipment.

Why not let a National Supply engineer study your power-transmission problems and tell you just how National Torque Converters can help you? Or send for a copy of our Bulletin No. 468.

THE NATIONAL SUPPLY COMPANY

INDUSTRIAL PRODUCTS DIVISION

Two Gateway Center, Pittsburgh 22, Pa.



*Pace-setters in the progress of
industrial power transmission*

Methods Memo . . .

Corps of Engineer Switch

Army Engineers in the Omaha and Kansas City districts are changing from one-year to continuous contracts to handle the stepped up program of Missouri River channel improvement work.

The one-year contracts, carried out as Congress made money available, meant that work couldn't begin until the start of the government's fiscal year on July 1 and had to be wrapped up before the fiscal year expired.

This resulted in loss of valuable construction time. Jobs came up at the peak of the construction season, but it often was Oct. 1 before contractors were completely mobilized and ready to start work. At the other end of the year, a contractor might finish his job early and have to let equipment stand idle until beginning of the next fiscal year.

This situation did not pinch too hard so long as river jobs were small, but now their size is growing rapidly. Formerly contracts ran around \$200,000; now the Omaha District has \$800,000 jobs under contract and is readying a \$1 million job. Contract total in the district is more than double the figure of a few years ago.

Just for Laughs?

The ceremony at the opening of the Kansas Turnpike struck a strange note. Distinguished speakers extolled the engineering and construction skills that went into the \$160 million project. And Gov. Fred Hall proclaimed it solution to the state's major transportation problem.

Then the first official travelers moved on to the sleek new toll road. They were Gene Autry and his horse, Champion.

A Useful Reference

McGraw-Hill Book Co. is preparing a 10-volume encyclopedia of engineering and science. It will be known as the "McGraw-Hill Encyclopedia of Science and Technology" and will total about 7,000 over-size pages.

Outstanding authorities in various fields will contribute articles for the encyclopedia. It is designed to serve as a complete reference work.

Initial publication, expected in about three years, will be followed by publication of annual yearbooks and periodic revisions to keep it up to date.

Controversy on Stilts

An Arizona lathing contractor pulled in at a job site one day a few years ago and discovered that he'd forgotten to load scaffolding on his truck. It was a long way back to the shop, and he wanted to finish the job. So he picked up some scrap lumber and hammered together a pair of stilts. The stilts worked fine.

That night Bob Skaggs told his brother Everett about the stilts, and shortly afterwards Skaggs Manufacturing Co. was born. It has shipped stilts all over the U.S. and reports that workmen find them easy to use.

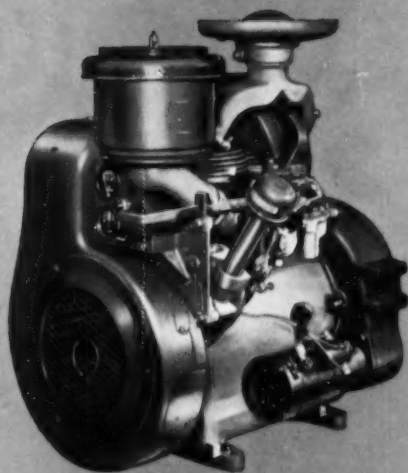
The stilts are aluminum with leather straps to attach them to the legs. A 5x7½-in. bottom plate provides stability. And a rubber pad on the plate protects against slipping.

Ironically, the trades for which the stilts were designed now are forbidden to use them. The Skaggs brothers say they have never heard of anyone having a serious accident on the stilts, but both the Plasterers' International and the International Lathers' Union have banned the stilts as unsafe. Any union lather who uses them is subject to a \$100 fine. Before the international unions acted, Phoenix Lathers' Local 374 had approved the stilts. So had the Ohio Safety Commission, the British Columbia Workmen's Compensation Board, and the Arizona Industrial Commission, among others.

Despite the opposition, the Skaggs say they still are doing a good business selling stilts to anyone who wants to grow 24 in. in a hurry.



ONE
ENGINE



with a
knack for
all trades!

The FULL POWER LYCOMING C2-90

Air-Cooled! Rated 30 h.p.—Delivers 30 h.p.!

Here's the tough, versatile engine that has an amazing variety of applications. And in this variety, the C2-90 is exposed to the most exacting working conditions . . . tested and proven in the field.

This amazing 30 h.p. unit offers you:

- The traditional air-cooled advantages of lighter weight, lower cost, all-weather performance, and superior endurance.
- FULL POWER performance—rated at 30 h.p.—*delivers* 30 h.p.!
- Highest horsepower and torque per cu. in. displacement in air-cooled field.
- Complete interchangeability—identical mounting and shaft dimensions with other major air-cooled industrial engine units in horsepower range.
- Reliability and simplicity for easy maintenance.

Yes! This engine does just what we say it will do. That's why it has been chosen by leading equipment manufacturers like those in the applications illustrated. Find out how Lycoming's 45 years of engine-building experience can solve your problems. Write:

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Drill Rig by
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AGRICULTURE
Windrower by
Owensboro Mfg. Corp. and
Houston Mfg. Co.



CONSTRUCTION
Contractor's Hoist by
Buck Equip. Co.



MATERIALS HANDLING
by Sproot-Waldron

CARBIDE INSERT? or MULTI-USE?



LOCATION: Lincoln Tunnel approach, Weehawken, N. J.

OPERATING CONDITIONS: Trap rock and sandstone.

Grow Construction Company speeds new Lincoln Tunnel approach with TIMKEN® DC carbide insert bits

WAGON drilling through abrasive trap rock and sandstone, Grow Construction Company drilled out full increments of steel and increased drilling speeds by using Timken® DC carbide insert bits.

Timken carbide insert bits are best for hard abrasive ground. You get fast, economical drilling with fewer bit changes for constant-gauge holes, small-diameter holes, and extremely deep holes.

Timken carbide insert bits may not be best for all drilling jobs. Drilling ordinary ground, for instance, is most economical when you use Timken *multi-use* bits. With correct and controlled reconditioning, they give you the lowest cost per foot of hole when you can drill out full increments of steel.

Both carbide and multi-use Timken bits are made from Timken fine alloy steel. We're the only removable bit manufacturer that makes its own steel. We do it to control quality at every step of the way.

Timken bits save time when drilling conditions change because many of them are interchangeable in the same thread series. You can switch bits when the ground changes without need for changing drill steels, too. And both Timken carbide insert and multi-use bits have special

shoulder unions that protect the threads from drilling impact.

To find out which Timken bit type is best for your needs, call or write the Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded
multi-use rock bit



Timken threaded
carbide insert rock bit

**your best bet
for the best bit
... for every job**

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